IEI Technology Corp.



MODEL:

ACT-408A-N270

Panel PC with Touch Screen and 1.6 GHz Intel® Atom™ CPU, MIFARE/EM RFID, Wiegand 26, Door Control, Gigabit Ethernet, 3 USB, RS-232/422/485, RoHS Compliant, IP 64 Protection

User Manual

Rev. 2.01 – 15 June, 2011



Revision

Date	Version	Changes
15 June, 2011	2.01	Add one note for the RFID reader
3 September, 2010	2.00	LCD panel and power adapter updates
29 December, 2009	1.01	Minor edit
26 October, 2009	1.00	Initial release

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Chapter 1

Introduction

1.1 ACT-408A-N270 All-in-One Access Control Terminal



Figure 1-1: ACT-408A-N270 All-in-One Access Control Terminal

The ACT-408A-N270 is 1.6 GHz Intel® Atom™ powered access control terminal with a RFID reader and a rich variety of functions. The ACT-408A-N270 is designed for easy and simplified integration in to access control applications.

An Intel® 945GSE graphics memory controller hub (GMCH) coupled with an Intel® ICH7M input/output controller hub ensures optimal memory, graphics, and peripheral I/O support. The system comes with 1 GB of preinstalled DDR2 SDRAM and supports a maximum of 2.0 GB of DDR2 SDRAM ensuring smooth data throughputs with reduced bottlenecks and fast system access.

Two serial ports and three external USB 2.0 ports ensure simplified connectivity to a variety of external peripheral devices. Wi-Fi capabilities and one RJ-45 Ethernet connector ensure smooth connection of the system to an external LAN.

1.1.1 Features

The ACT-408A-N270 features the following:

- 8.4” TFT LCD with resistive type touch screen
- 1.6 GHz Intel® Atom™ CPU with 512 KB L2 cache preinstalled
- Built-in RFID reader supports Mifare card and EM card read/write
- Preinstalled 1 GB DDR2 memory module
- 802.11 b/g wireless module
- One RJ-45 RS-232 serial port and one RJ-45 RS-232/422/485 serial port
- Three USB 2.0 ports
- CompactFlash® Type II slot
- Provides RFID configuration tool to read or write Mifare tags and EM tags
- Built-in digital camera and microphone
- Built-in 3.0 W stereo speakers
- IP 64 compliant front panel
- RoHS compliance

1.1.2 Applications

The ACT-408A-N270 is elegant yet sophisticated systems that are easily implemented in diverse environments including:

- Door access
- Time attendance
- Cashless payment terminal
- Parking access control

1.2 External Overview

The stylish ACT-408A-N270 access control terminal comprises of a screen, front and rear panels. An ABS/PC plastic front frame surrounds the front screen. The rear panel provides screw holes for a wall-mounting bracket compliant with VESA FDMI standard. An I/O interface panel on the rear panel provides access to external interface connectors that include LAN, USB 2.0, serial port, reset button, power connector and power switch.

1.2.1 Front Panel

The front side of the ACT-408A-N270 is a flat panel TFT LCD screen surrounded by an ABS/PC plastic hard cover. The front panel has a 300K pixel digital camera, two microphones, a power LED indicator, power button, a USB port, a RFID reader for Mifare/EM tags, and two speakers for stereo sound (**Figure 1-2**).



Figure 1-2: ACT-408A-N270 Front View

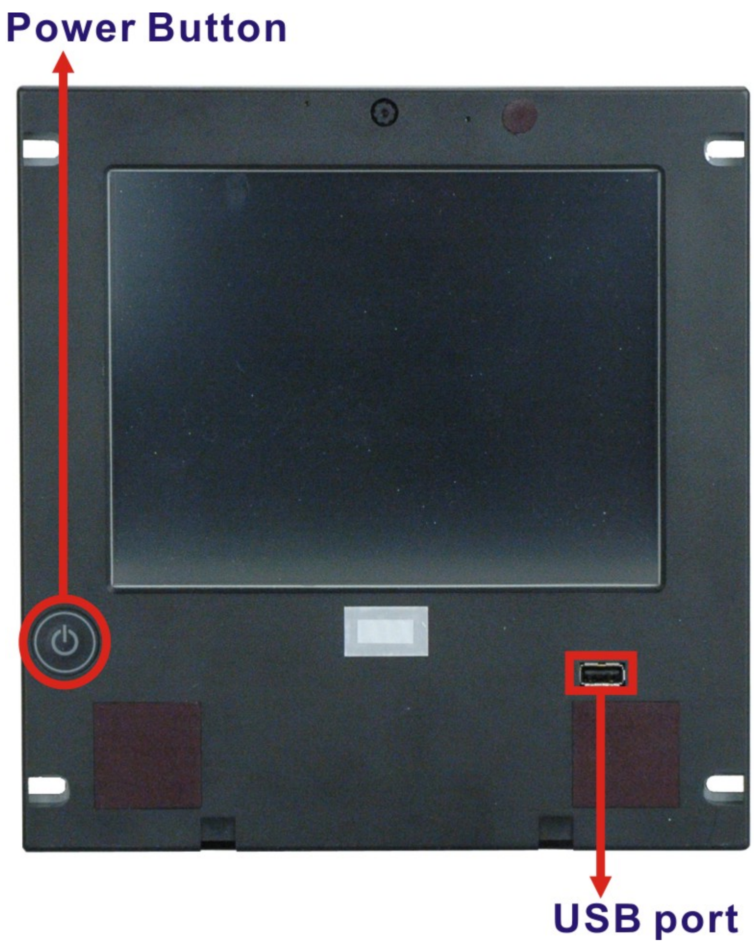


Figure 1-3: Front View (Faceplate Removed)

1.2.2 RFID Reader

A RFID reader is integrated in the front panel and supports Mifare 13.56 MHz or EM 125 KHz RFID tags. The ACT-408A-N270 also comes with a RFID tool to read or write data on or into the Mifare tags or EM tags. Please refer to **Chapter 3** for detailed description of the RFID tool (RF320).

1.2.3 Rear Panel

The rear panel provides access to retention screw holes that support the VESA 75 and 100 mounting. Refer to **Figure 1-4**.

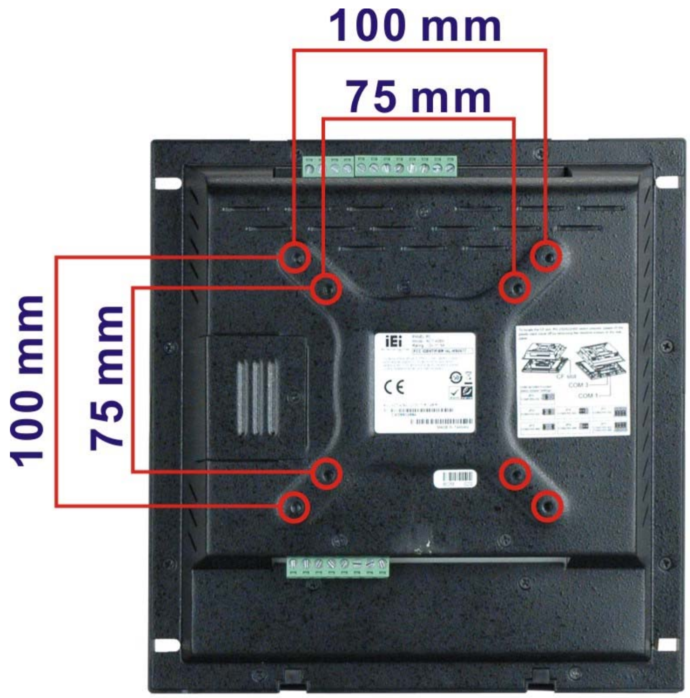


Figure 1-4: ACT-408A-N270 Rear View

1.2.4 I/O Interface Panels

The I/O interface panels located on the bottom and top panels of the ACT-408A-N270 (**Figure 1-5**) have the following I/O interface connectors:

- 1 x 12 V DC power jack
- 1 x RJ-45 RS-232 port
- 1 x RJ-45 RS-232 or RS-422/485 port
- 1 x RJ-45 GbE LAN connectors
- 2 x USB 2.0 ports
- 1 x 8-pin Wiegand RFID reader input
- 1 x 8-pin Digital output for door control
- 1 x 4-pin Digital input

The external I/O interface connectors on the bottom panel are shown in **Figure 1-5**.

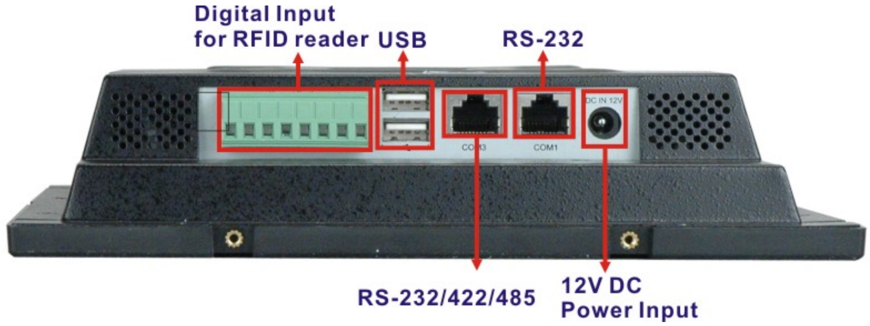


Figure 1-5: ACT-408A-N270 Bottom View

The external I/O interface connectors on the top panel are shown in **Figure 1-5**.

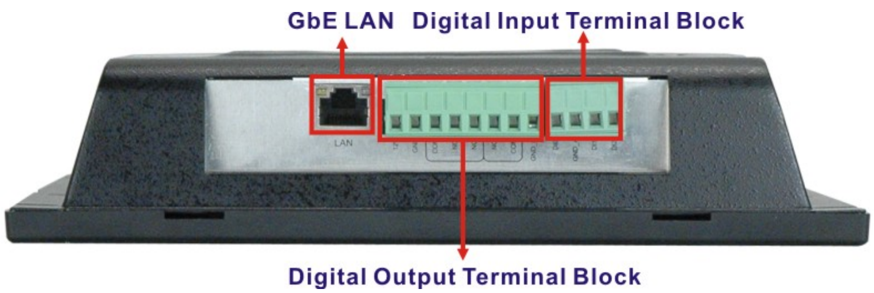


Figure 1-6: ACT-408A-N270 Top View

1.2.5 CompactFlash® Slot

The system can also support a CompactFlash® Type II (CF Type II) memory disk.



Figure 1-7: CompactFlash® Slot

1.3 Internal Overview

The ACT-408A-N270 has the following components installed internally:

- 1 x Motherboard
- 1 x 1 GB DDR2 SDRAM SO-DIMM
- 1 x Wireless module
- 1 x RFID reader
- 2 x Speakers
- 1 x Digital camera
- 1 x Microphone

1.4 Specifications

The ACT-408A-N270 has the following preinstalled components:

- 1 x Motherboard
- 1 x TFT LCD screen
- 1 x Touch screen
- 1 x Inverter
- 1 x Wireless LAN module
- 1 x DDR2 memory module

The following section lists the system specifications. The technical specifications for some other preinstalled components are shown in the **Appendix A**.

1.4.1 System Specifications

The technical specifications for the ACT-408A-N270 system are listed in **Table 1-1.**

Specifications	ACT-408A-N270
LCD Size	8.4”
Max. Resolution	800 x 600 (XGA)
Brightness	450 cd/m^2
Contrast Ratio	600:1
LCD Color	262 K

Pixel Pitch (mm)	0.213 (H) x 0.213 (V)
Viewing Angle (H-V)	140 (H) / 160 (V)
Backlight MTBF	30,000 hours
SBC Model	ACTMB4-945GSE-N270-R10
CPU	1.6 GHz Intel® Atom™ CPU with 512 KB L2 cache
Northbridge Chipset	Intel® 945GSE
Southbridge Chipset	Intel® ICH7M
Memory	One 400/533 MHz DDR2 SDRAM SO-DIMM supported (system max. 2 GB)
SSD	CF Type II
Watchdog Timer	Software Programmable supports 1 sec. ~ 255 sec. system reset
Audio	AMP 3.0 W + AMP 3.0 W (built-in stereo speakers)
Expansion	One PCIe Mini card slot (for wireless LAN 802.11 b/g module)
Camera and MIC	Built-in 300 K pixel camera and digital microphone
RFID	Supports MIFARE and EM RFID
I/O Ports and Switches	One 12 V DC power jack
	One 4-pin terminal block for signal input 3 x Digital Input 1 x GND
	One 8-pin terminal block for signal output 1 x Relay control for Door (COMMON, Normal Close, Normal Open) 1 x Relay control for Alarm+ (COMMON) Alarm- (NO) 1 x 12V output (for Door control) 2 x GND
	One 8-pin terminal block for signal input (Wiegand Reader) 5 x Digital Input 1 x 12V output 2 x GND
	One RJ-45 for RS-232 COM port
	One RJ-45 for RS-232/422/485 COM port

	One GbE LAN connector
	Three USB 2.0 ports
	One Power button on front panel
Construction Material	ABS + PC plastic front frame Aluminum alloy chassis
Front Panel Color	White
Mounting	In-Wall, Panel, Wall, Stand or Arm (VESA 75 x 75 mm, 100 x 100 mm)
IP level (front panel)	IP 64
EMC	CE and FCC
Safety	CB and CCC
Touch Screen	5-wire resistive type
Power Adapter	60W, 12 V DC output, 90 ~ 264 V AC, 50/60 Hz input
Power Consumption	35 W
Operation Temperature	0ºC ~ 45ºC
Dimensions (W x H x D) (mm)	225 x 236.5 x 52.5
Net weight	1.5 kg

Table 1-1: ACT-408A-N270 System Specifications

1.5 Dimensions

The dimensions of the ACT-408A-N270 are shown in **Figure 1-8** and listed below.

- **Width**: 225 mm
- **Height**: 236.5 mm
- **Depth**: 52.5 mm

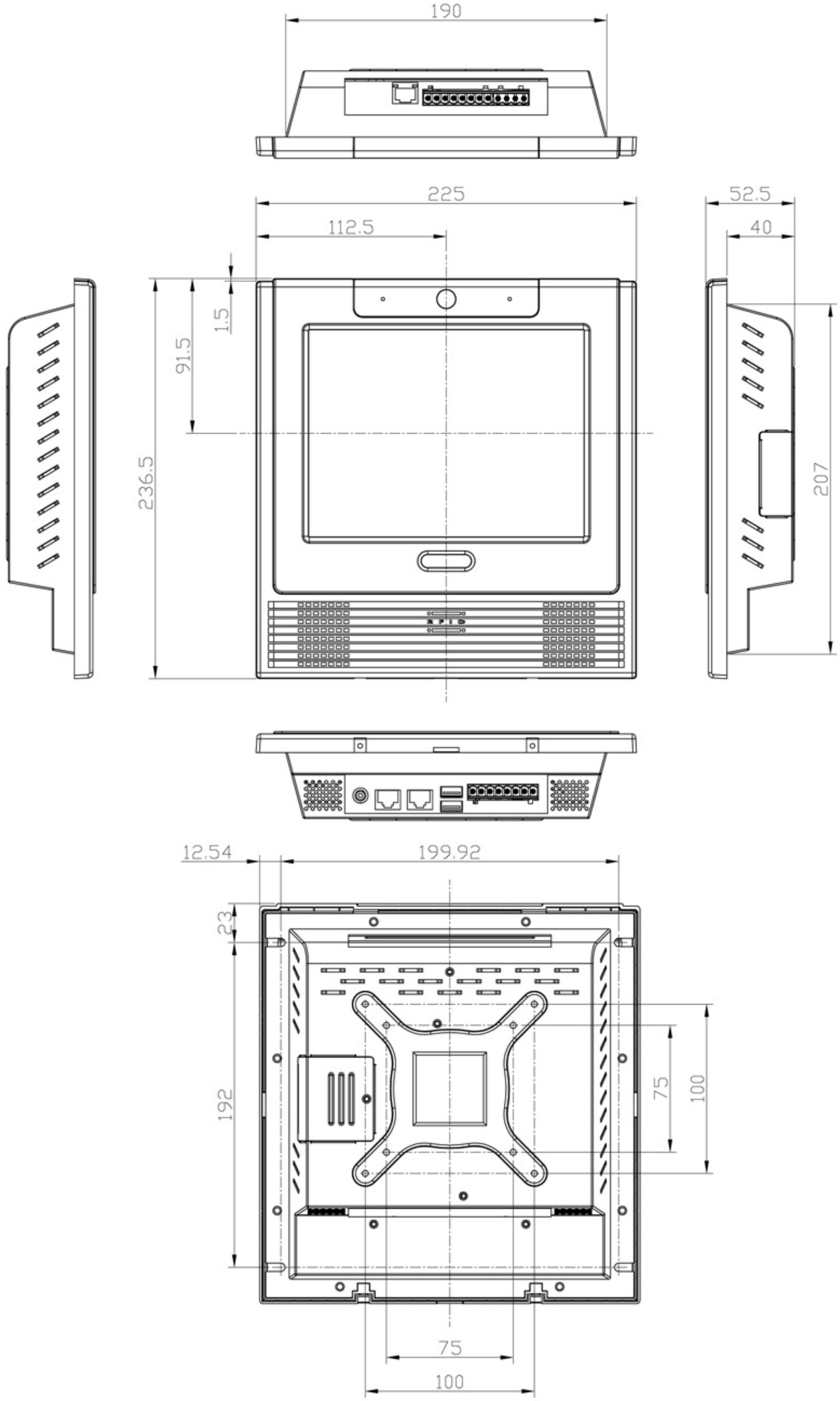


Figure 1-8: ACT-408A-N270 Dimensions (mm)

Chapter 2

Installation

2.1 Unpacking

To unpack the access control terminal, follow the steps below:

WARNING!

The front side LCD screen has a protective plastic cover stuck to the screen. Only remove the plastic cover after the ACT-408A-N270 has been properly installed. This ensures the screen is protected during the installation process.

Step 1: Use box cutters, a knife or a sharp pair of scissors that seals the top side of the external (second) box.

Step 2: Open the external (second) box.

Step 3: Use box cutters, a knife or a sharp pair of scissors that seals the top side of the internal (first) box.

Step 4: Lift the monitor out of the boxes.

Step 5: Remove both polystyrene ends, one from each side.

Step 6: Pull the plastic cover off the ACT-408A-N270.

Step 7: Make sure all the components listed in the packing list are present.

2.1.1 Packing List

The ACT-408A-N270 access control terminal is shipped with the following components:

Quantity	Item	Image
1	ACT-408A-N270 access control terminal	
1	Screw set	
4	Adhesive foam tape strips	
1	Power adapter	
1	Power cord	
1	Touch pen	
1	User manual CD and driver CD	
1	Mini jumper pack (2.0 mm)	

If any of these items are missing or damaged, contact the distributor or sales representative immediately.

2.2 Anti-Static Precautions

WARNING:

Failure to take ESD precautions during the maintenance of the ACT-408A-N270 may result in permanent damage to the ACT-408A-N270 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ACT-408A-N270. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ACT-408A-N270 is accessed internally, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the ACT-408A-N270, place it on an antic-static pad. This reduces the possibility of ESD damaging the ACT-408A-N270.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

2.3 Installation Precautions

When installing the POS system, please follow the precautions listed below:

- **Power turned off**: When installing the system, make sure the power is off. Failing to turn off the power may cause severe injury to the body and/or damage to the system.
- **Certified Engineers**: Only certified engineers should install and modify onboard functionalities.
- **Anti-static Discharge**: If a user open the rear panel of the system, to

configure the jumpers or plug in added peripheral devices, ground themselves first and wear and anti-static wristband.

2.4 Preinstalled Components

The following components are all preinstalled.

- Motherboard
- TFT LCD screen
- DDR2 memory module
- Resistive type touch screen
- RFID module
- Wireless LAN module

Component installation is described in **the following sections.**

2.5 Installation and Configuration Steps

The following installation steps must be followed.

Step 1: Unpack the ACT-408A-N270

Step 2: Install CF card

Step 3: Configure the system

Step 4: Mount the ACT-408A-N270

Step 5: Connect peripheral devices to the bottom panel of the ACT-408A-N270.

2.6 Rear Panel Removal

To access the CF slot and AT/ATX switch, the back cover must be removed. To remove the back cover, please follow the steps below.

Step 1: Place the ACT-408A-N270 face down on a flat surface.

Step 2: **Remove the Terminal Block Connectors**. Remove the three terminal block connectors (**Figure 2-1**) from the top and bottom panels. A flat-headed screwdriver may be required to gently remove the connectors.

Step 3: **Remove the rear panel**. Remove the retention screws (**Figure 2-1**) from the rear panel and lift the back cover off the ACT-408A-N270.

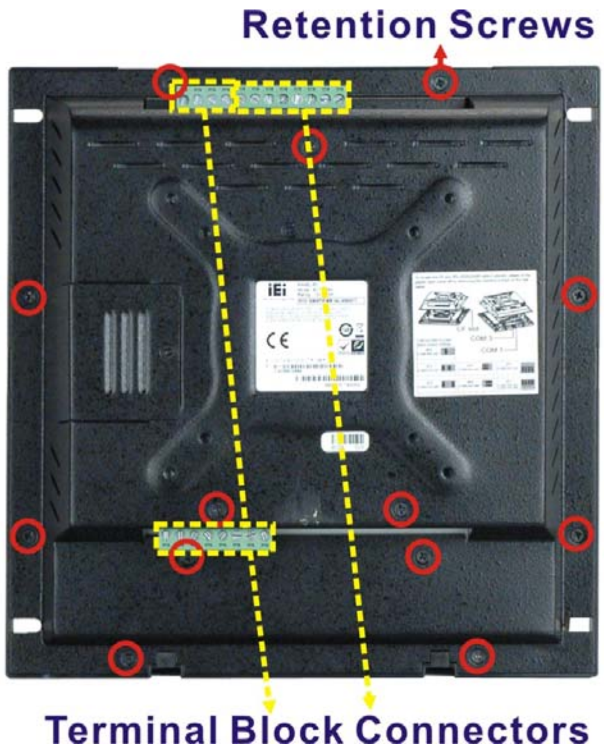


Figure 2-1: Rear Panel

2.7 CF Card Installation

The ACT-408A-N270 has one CF Type II slot. To install the CF card, follow the instructions below.

Step 1: **Locate the CF card slot cover**. The CF card slot cover is located on the back panel of the ACT-408A-N270. See **Figure 2-2**

Step 2: **Remove the retention screw and cover.** Remove the retention screw and remove the cover



Figure 2-2: CF Card Slot Cover Location

Step 3: **Install the CF Card**. Correctly align the CF card with the socket and insert the CF card into the socket. See **Figure 2-3**.



Figure 2-3: CF Card Installation

Step 4: **Replace the CF card slot cover**. Make sure the cover is properly secured with the previously removed retention screw.

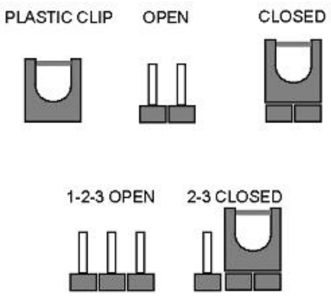
2.8 Power Adapter

The system is shipped with a 90 V to 264 V IEI AC power adapter with a maximum power output of 60 W. The power adapter has a 12 V DC output connector.

2.9 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



Before the ACT-408A-N270 is installed, the jumpers must be set in accordance with the desired configuration. The jumpers on the ACT-408A-N270 motherboard are listed in **Table 2-1**.

Description	Label	Type
Clear CMOS	J_CMOS1	2-pin header
COM3 RX RS-232/422/485 select	JP3	8-pin header
COM3 TX RS-422/485 select	JP4	6-pin header
COM3 RS-232/422/485 select	JP7	12-pin header

Table 2-1: Jumpers

2.9.1 Access the Jumpers

To access the jumpers, the rear panel and the aluminum cover must be removed. To remove the rear panel and the aluminum cover, please follow the steps below.

Step 1: Put the front panel of the ACT-408A-N270 on a table.

Step 2: **Remove the Terminal Block Connectors**. Remove the three terminal block connectors (**Figure 2-1**) from the top and bottom panels. A flat-headed screwdriver may be required to gently remove the connectors.

Step 3: **Remove the rear panel**. Remove the retention screws (**Figure 2-1**) from the rear panel and lift the rear panel off the ACT-408A-N270.

Step 4:

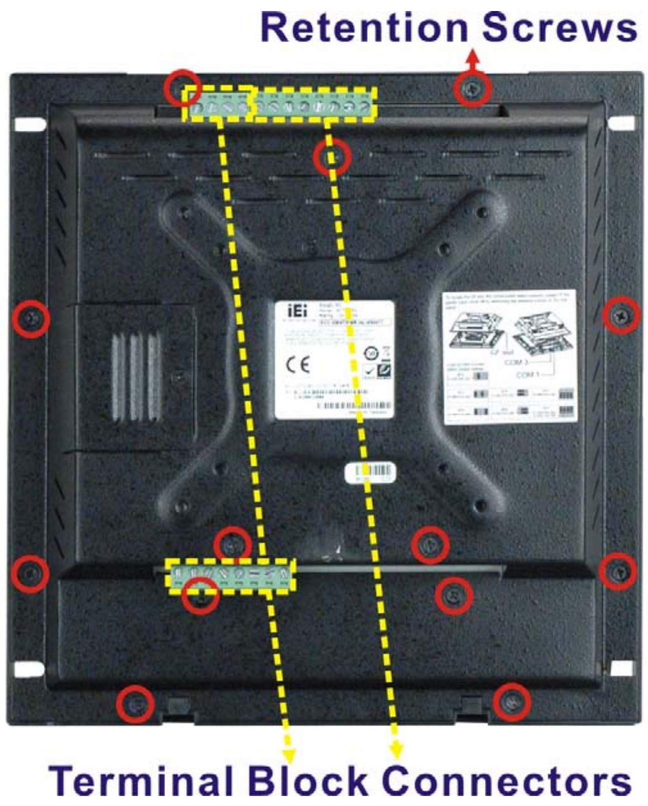


Figure 2-4: Rear Panel Retention Screws

2.9.2 Preconfigured Jumpers

WARNING:

Do not change the settings on the jumpers in described here. Doing so may disable or damage the system.

The following jumpers are preconfigured for the ACT-408A-N270. Users should not change these jumpers (**Table 2-2**).

Jumper Name	Label	Type
LVDS voltage selection	J_VLVDS1	3-pin header
Panel Type and Resolution	J_LCD_TYPE1	10-pin header

Table 2-2: Preconfigured Jumpers

2.9.3 Clear CMOS Jumper

Jumper Label: **J_CMOS1**

Jumper Type: 2-pin header

Jumper Settings: See **Table 2-3**

Jumper Location: See **Figure 2-5**

If the ACT-408A-N270 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close the pins for a few seconds then remove the jumper clip.

If the "CMOS Settings Wrong" message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 2-3**.

Clear CMOS	Description	
Short 1 - 2	**Keep CMOS Setup**	**Default**
Short 2 - 3	**Clear CMOS Setup**	

Table 2-3: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 2-5** below.

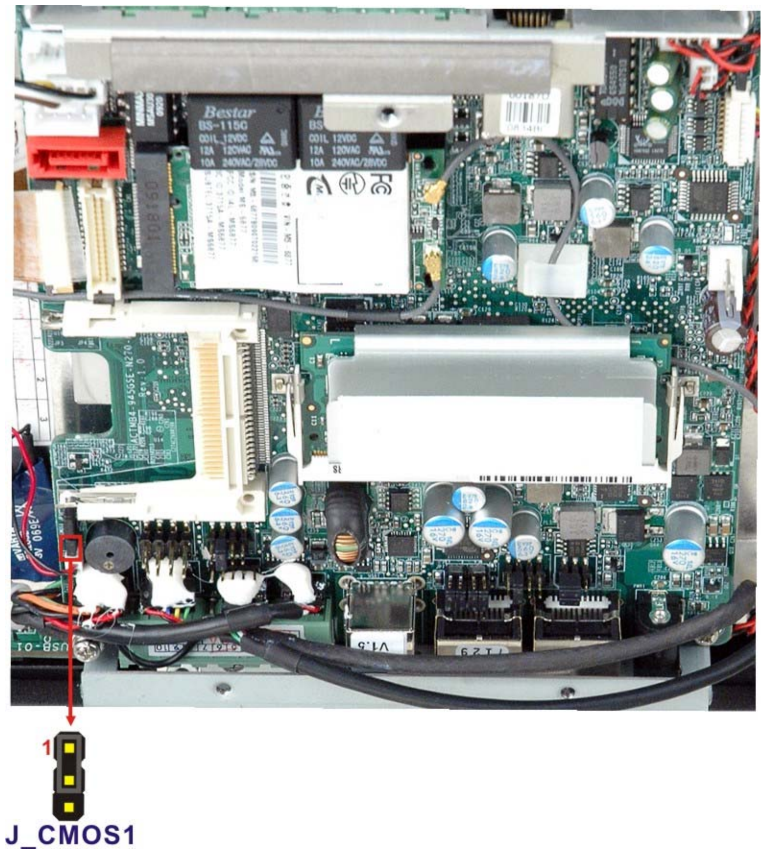


Figure 2-5: Clear CMOS Jumper

2.9.4 COM3 RX Function Select Jumper

Jumper Label: **JP3**

Jumper Type: 8-pin header

Jumper Settings: See **Table 2-4**

Jumper Location: See **Figure 2-6**

The COM3 RX Function Select jumper sets the communication protocol used by the RX serial communications port COM3 as RS-232, RS-422 or RS-485. The COM3 RX Function Select jumper settings are shown in **Table 2-4**.

COM3 RX Function Select	Description	
Short 3-4	**RS-232**	**Default**
Short 1-2, 5-6	**RS-422**	
Short 1-2, 7-8	**RS-485**	

Table 2-4: COM3 RX Function Select Jumper Settings

The COM3 RX Function Select jumper location is shown in **Figure 2-6**.

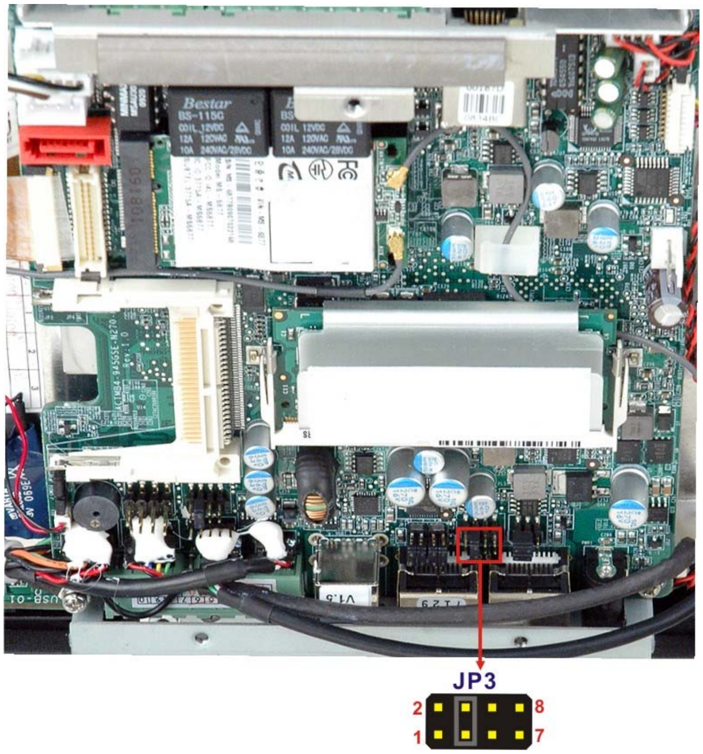


Figure 2-6: COM3 RX Function Select Jumper Location

2.9.4.1 COM3 RS-422 and RS-485 Pinouts

The pinouts for RS-422 and RS-485 operation of external serial port COM 3 are detailed below.

COM 3	RS-422 Description
Pin 1	**TX-**
Pin 2	**TX+**
Pin 6	**RX-**
Pin 7	**RX+**

Table 2-5: RS-422 Pinouts

COM 3	RS-485 Description
Pin 1	**Data-**
Pin 2	**Data+**

Table 2-6: RS-485 Pinouts

2.9.5 COM3 TX Function Select Jumper

Jumper Label: **JP4**

Jumper Type: 6-pin header

Jumper Settings: See **Table 2-7**

Jumper Location: See **Figure 2-7**

The COM3 TX Function Select jumper configures the TX pin on COM3 serial port connector as RS-422 as an RS-485. The COM3 TX Function Select jumper selection options are shown in **Table 2-7**.

COM3 TX Function Select	Description
Short 1 – 3	**RS-422**
Short 2 – 4	**RS-422**
Short 3 – 5	**RS-485**
Short 4 – 6	**RS-485**

Table 2-7: COM3 TX Function Select Jumper Settings

The COM3 TX Function Select jumper location is shown in **Figure 2-7** below.

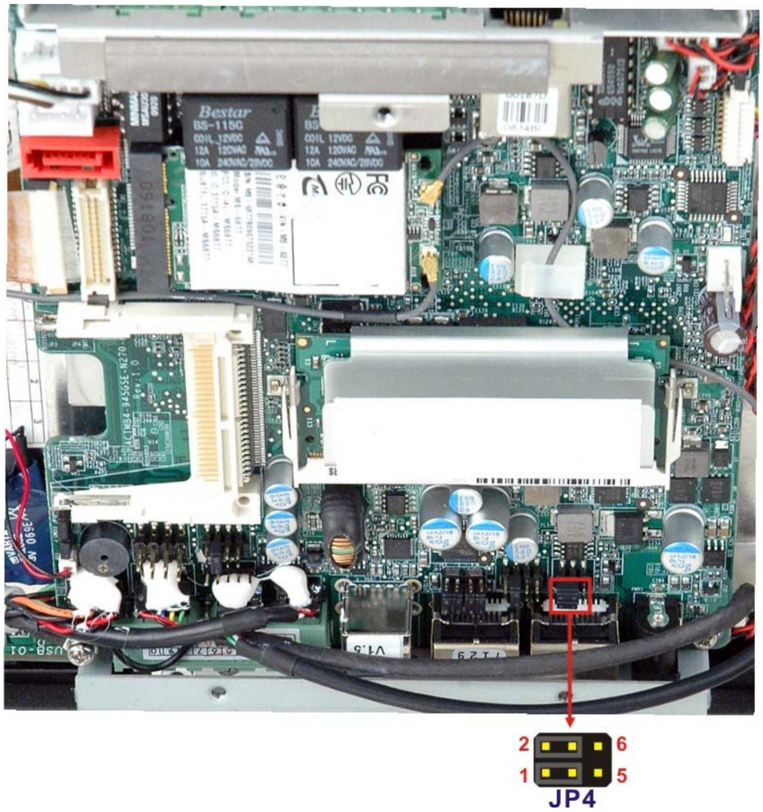


Figure 2-7: COM3 TX Function Select Jumper Pinout Locations

2.9.6 COM3 RS-232/422/485 Serial Port Select Jumper

Jumper Label:	**JP7**
Jumper Type:	12-pin header (four 3-pin headers combined)
Jumper Settings:	See **Table 2-8**
Jumper Location:	See **Figure 2-8**

The COM3 RS-232/422/485 Serial Port Select jumper sets the communication protocol used by the second serial communications port (COM3) as RS-232, RS-422 or RS-485. The COM3 RS-232/422/485 Serial Port Select settings are shown in **Table 2-8**.

RS-232/485 Select	Description	
Short 1-2	**RS-232**	**Default**
Short 4-5	**RS-232**	**Default**
Short 7-8	**RS-232**	**Default**
Short 10-11	**RS-232**	**Default**
Short 2-3	**RS-422/485**	
Short 5-6	**RS-422/485**	
Short 8-9	**RS-422/485**	
Short 11-12	**RS-422/485**	

Table 2-8: COM3 RS-232/422/485 Serial Port Select Jumper Settings

The COM3 RS-232/422/485 Serial Port Select jumper location is shown in **Figure 2-8**.

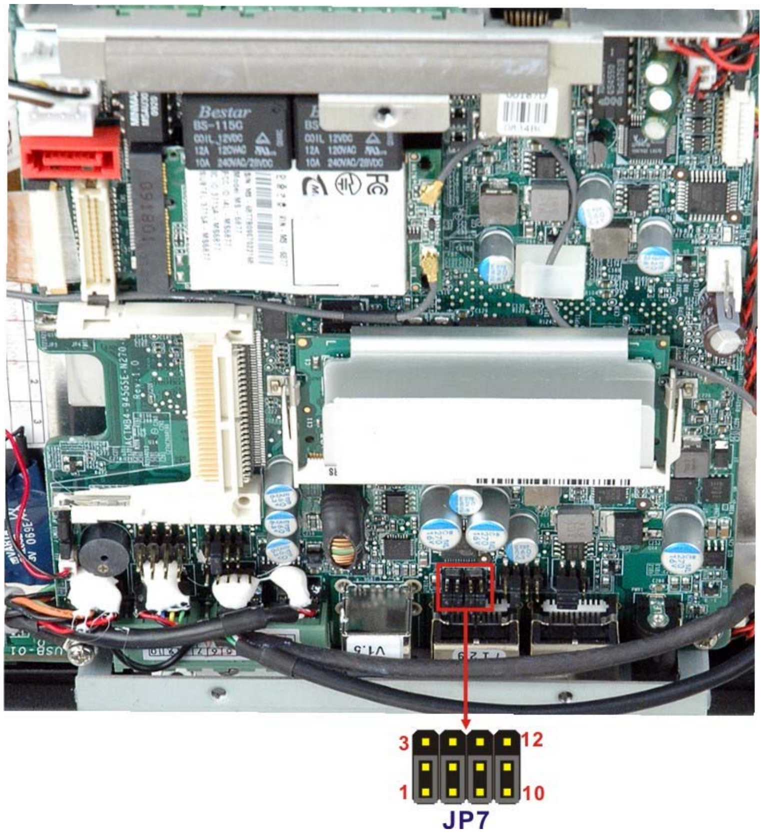


Figure 2-8: COM3 RS-232/422/485 Serial Port Select Jumper Location

2.10 Mounting the System

WARNING!

When mounting the flat panel PC onto an arm, onto the wall or into a wall, it is better to have more than one person to help with the installation to make sure the panel PC does not fall down and get damaged.

2.10.1 Wall Mounting

To mount the ACT-408A-N270 onto the wall, please follow the steps below.

Step 5: Select the location on the wall for the wall-mounting bracket.

Step 6: Carefully mark the locations of the four screw holes in the bracket on the wall.

Step 7: Drill four pilot holes at the marked locations on the wall for the bracket retention screws.

Step 8: Align the wall-mounting bracket screw holes with the pilot holes.

Step 9: Secure the mounting-bracket to the wall by inserting the retention screws into the four pilot holes and tightening them (**Figure 2-9**).

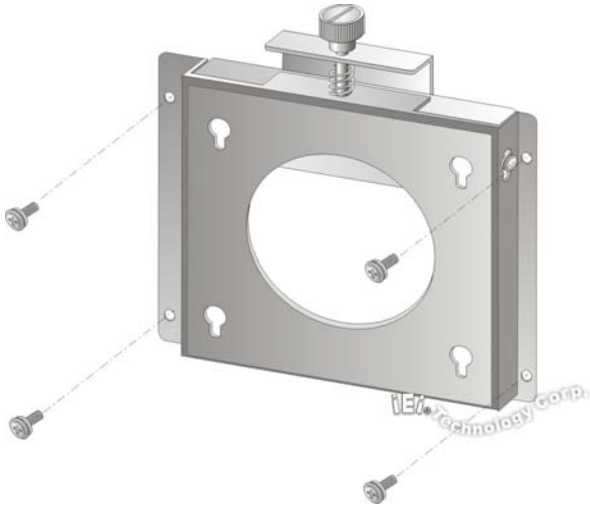


Figure 2-9: Wall-mounting Bracket

Step 10: Insert the four monitor mounting screws provided in the wall mounting kit into the four screw holes on the real panel of the ACT-408A-N270 and tighten until the screw shank is secured against the rear panel (**Figure 2-10**).

Step 11: Align the mounting screws on the rear panel with the mounting holes on the bracket.

Step 12: Carefully insert the screws through the holes and gently pull the monitor downwards until the ACT-408A-N270 rests securely in the slotted holes (**Figure 2-10**). Ensure that all four of the mounting screws fit snuggly into their respective slotted holes.

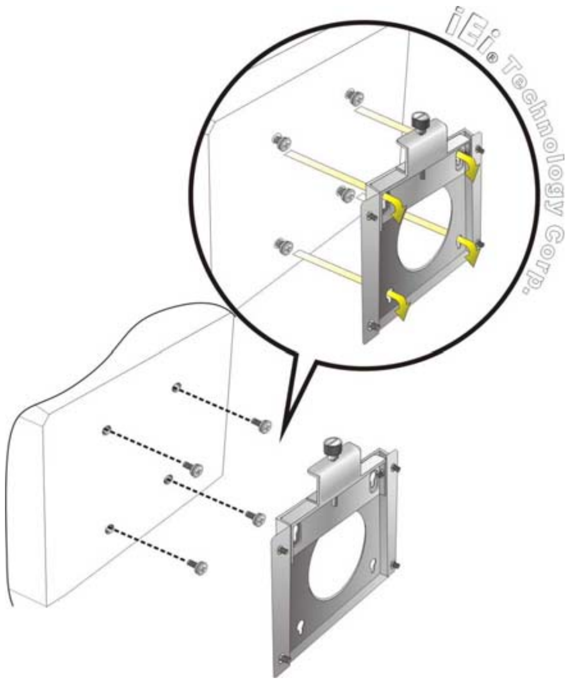


Figure 2-10: Chassis Support Screws

NOTE:

In the diagram below the bracket is already installed on the wall.

Step 13: Secure the ACT-408A-N270 by fastening the retention screw of the wall-mounting bracket. (**Figure 2-11**).

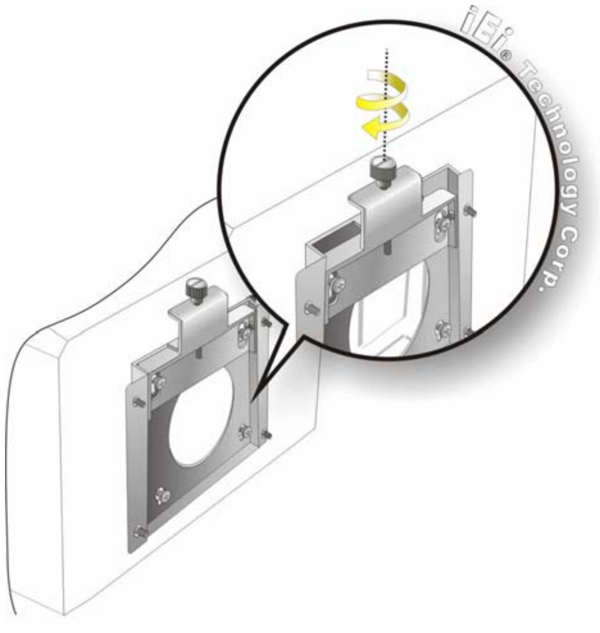


Figure 2-11: Secure the ACT-408A-N270

2.10.2 In-wall Mounting

Before installing into a wall mounting, attach the adhesive strips to the sides as shown below:

Step 14: Place the ACT-408A-N270 face down on a flat surface.

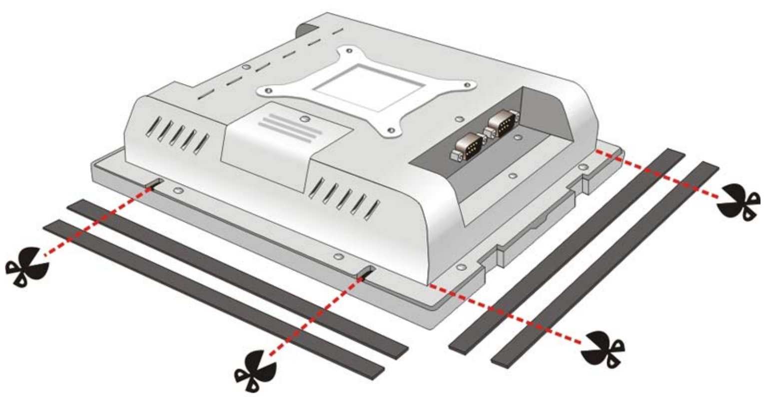


Figure 2-12: Cut Foam Tape

Step 15: Cut the adhesive foam tape as shown above.

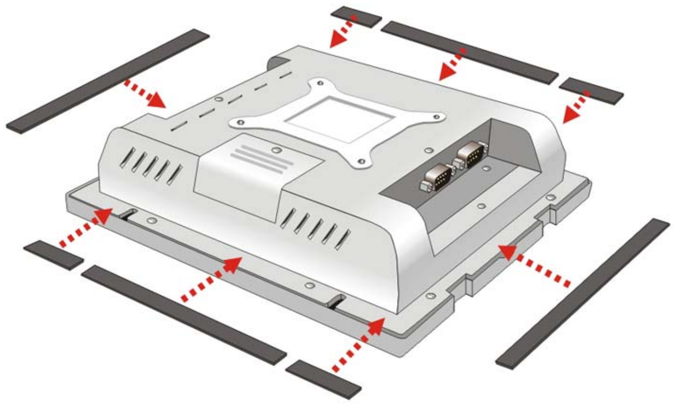


Figure 2-13: Attach Foam Tape

Step 16: Attach the adhesive foam tape to the edge of rear panel of the ACT-408A-N270 (see **Figure 2-13)**. Make sure the adhesive tape does not cover the screw holes as shown below.

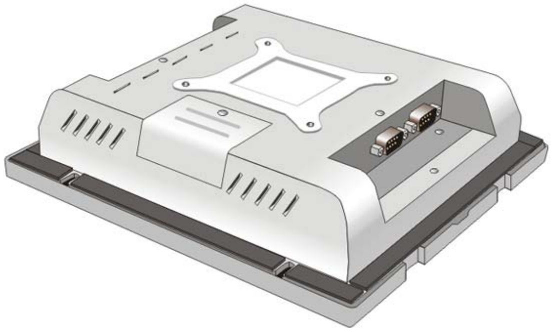


Figure 2-14: Foam Tape Installed

To mount the ACT-408A-N270 panel PC into a wall, please follow the steps below.

Step 17: Select the position on the wall to mount the flat panel PC.

Step 18: Cut out a section from the wall that corresponds to the dimensions in **Figure 2-15**. Take care that the wall section that is cut out is no larger than the suggested cut out size.

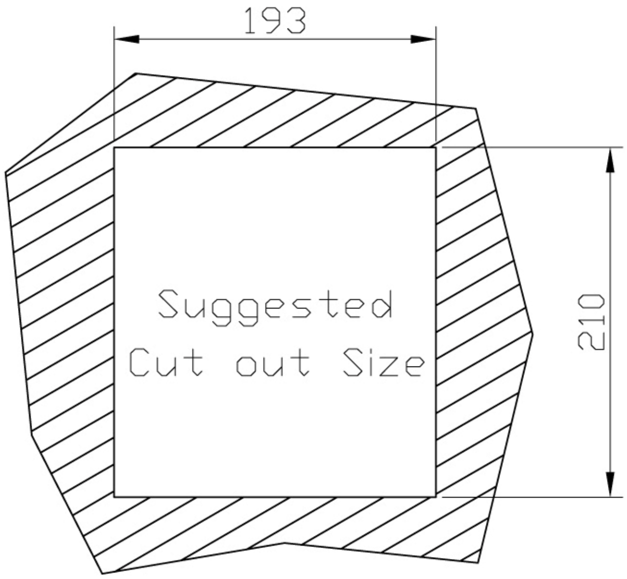


Figure 2-15: ACT-408A-N270 Panel Opening

Step 19: Slide the ACT-408A-N270 through the hole until the frame is flush against the wall.

Step 20: Tighten the screws that pass through the wall mounting screw holes until the screws are firmly secured to the wall (**Figure 2-16**).

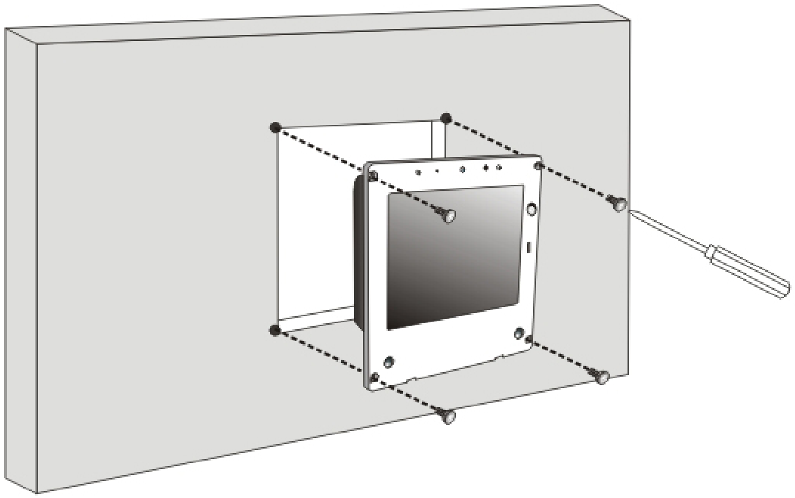


Figure 2-16: Tighten the In-wall Mounting Screws

Step 21: Install the faceplate. Snap faceplate onto the ACT-408A-N270 frame. See **Figure 2-17**.



Figure 2-17: Faceplate Installation

2.10.3 Arm Mounting

The ACT-408A-N270 is VESA (Video Electronics Standards Association) compliant and can be mounted on an arm with a 75 mm or 100 mm interface pad. To mount the ACT-408A-N270 on an arm, please follow the steps below.

Step 1: The arm is a separately purchased item. Please correctly mount the arm onto the surface it uses as a base. To do this, refer to the installation documentation that came with the mounting arm.

NOTE:

When purchasing the arm please ensure that it is VESA compliant and that the arm has a 75 mm or 100 mm interface pad. If the mounting arm is not VESA compliant it cannot be used to support the ACT-408A-N270.

Step 2: Once the mounting arm has been firmly attached to the surface, lift the flat panel PC onto the interface pad of the mounting arm.

Step 3: Align the retention screw holes on the mounting arm interface with those in the

flat panel PC. The ACT-408A-N270 arm mount retention screw holes are shown in **Figure 2-18**.

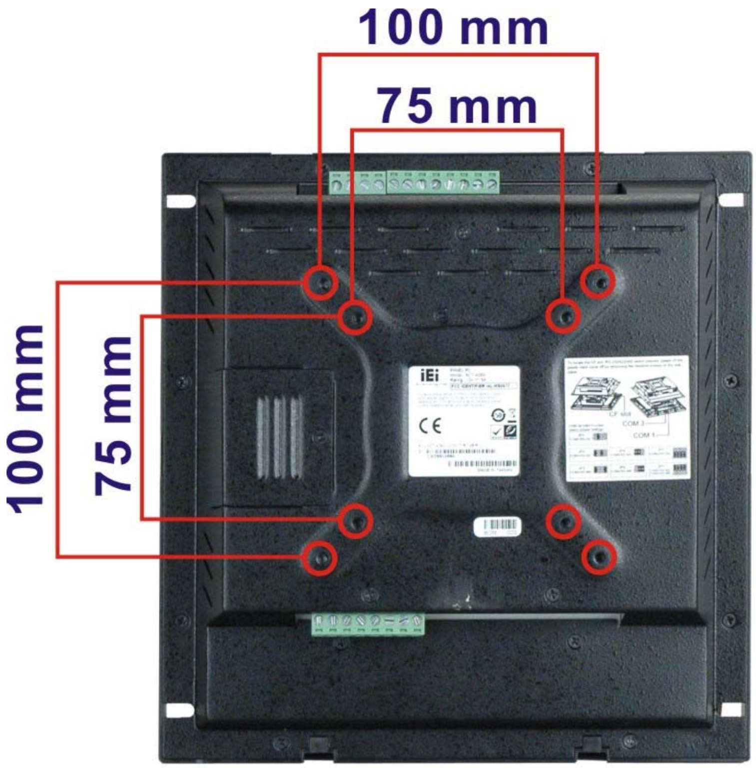


Figure 2-18: ACT-408A-N270 Arm Mounting Retention Screw Holes

Step 4: Secure the flat panel PC to the interface pad by inserting four retention screws through the bottom of the mounting arm interface pad and into the flat panel PC.

2.11 Bottom Panel Connectors

2.11.1 LAN Connection

There is one external RJ-45 LAN connector on the top panel. The RJ-45 LAN connector enables connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connector** on the top panel of the ACT-408A-N270.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with the

RJ-45 connector on the top panel of the ACT-408A-N270. See **Figure 2-19**.

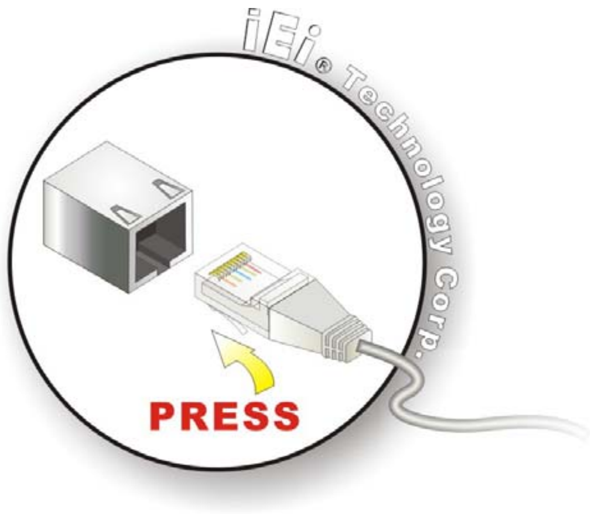


Figure 2-19: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

2.11.2 Serial Device Connection

The ACT-408A-N270 has two RJ-45 Serial port connectors on the bottom panel for serial devices to be connected. Follow the steps below to connect a serial device to the ACT-408A-N270 system.

Step 1: **Locate the RJ-45 Serial port connectors**. The location of the RJ-45 Serial port connectors is shown in **Chapter 2**.

Step 2: **Insert the serial connector**. Gently insert the RJ-45 connector on the serial device cable into the RJ-45 connector on the bottom panel. See **Figure 2-20**.

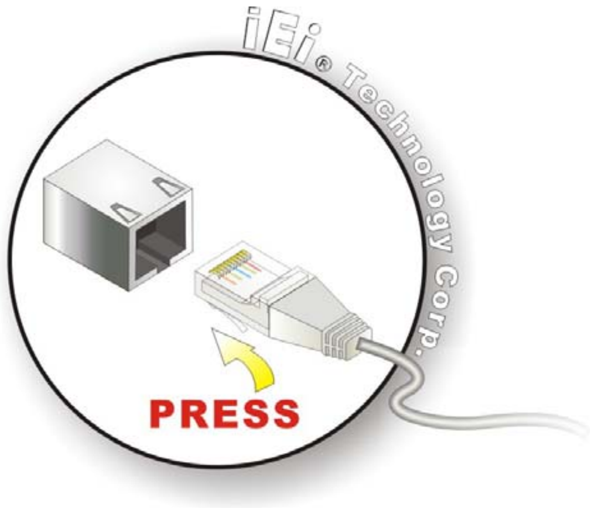


Figure 2-20: Serial Device Connector

2.11.3 USB Device Connection

There are three external USB 2.0 connectors. To connect a USB 2.0 or USB 1.1 device, please follow the instructions below.

Step 3: **Located the USB connectors**. The locations of the USB connectors are shown in **Chapter 2**.

Step 4: **Align the connectors.** Align the USB device connector with one of the connectors on the bottom panel. See **Figure 2-21**.

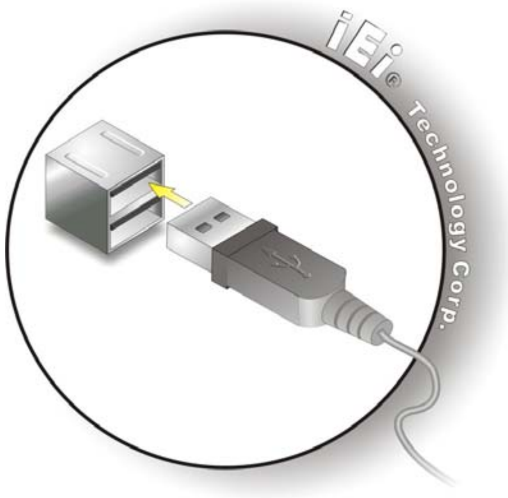


Figure 2-21: USB Device Connection

Step 5: **Insert the device connector.** Once aligned, gently insert the USB device connector into the onboard connector.

Chapter

3

RFID Reader

3.1 Introduction

IEI provides a RFID tool (RF320) to configure Mifare cards and EM cards. The following sections describe how to install the RF320 and how to use RF320 to configure Mifare cards and EM cards.

NOTE:

Attach the RFID cards close to the RFID reader less than 1 cm so that the cards can be detected effectively.

3.2 Installation

The RF320 must be installed in the ACT-408A-N270 from the utility CD in the package before using it to configure the RFID cards. To install the RF320, please follow the steps below. The following example is based on the Windows® XP environment.

Step 1: Run the **RF-320 setup V1.3.2.exe** file from the utility CD.

Step 2: The **InstallShield Wizard** is prepared to guide the user through the rest of the process. Once initialized, the **InstallShield Wizard** welcome screen appears (**Figure 3-1**).

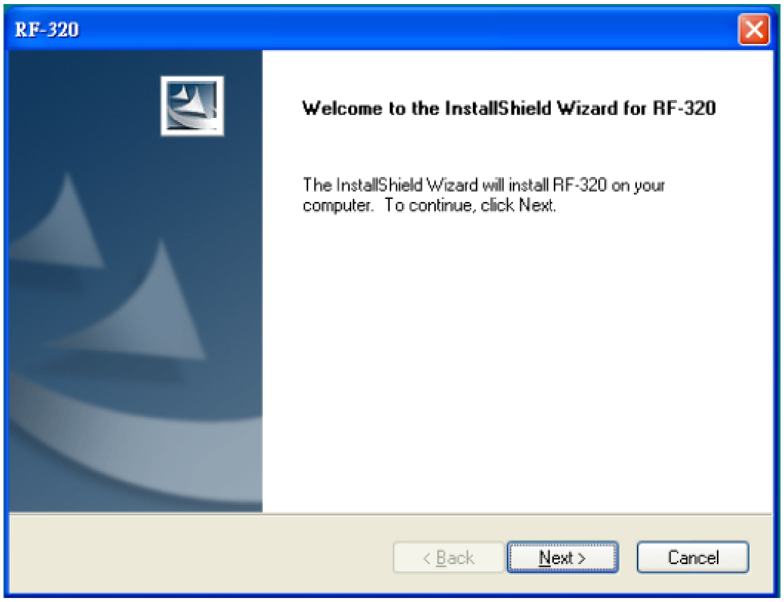


Figure 3-1: InstallShield Wizard Welcome Screen

Step 3: Click **NEXT** to continue the installation.

Step 4: The **Customer Information** screen shown in **Figure 3-2**. Enter a user name and a company name. Click **NEXT** to continue the installation.

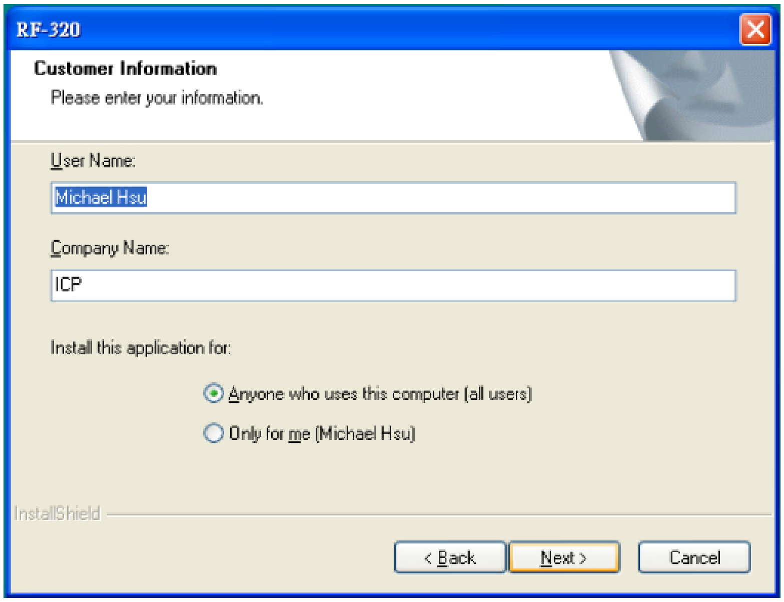


Figure 3-2: Customer Information Screen

Step 5: At this stage in **Figure 3-3** appears. Please choose the setup type. Click **NEXT** to continue the installation.

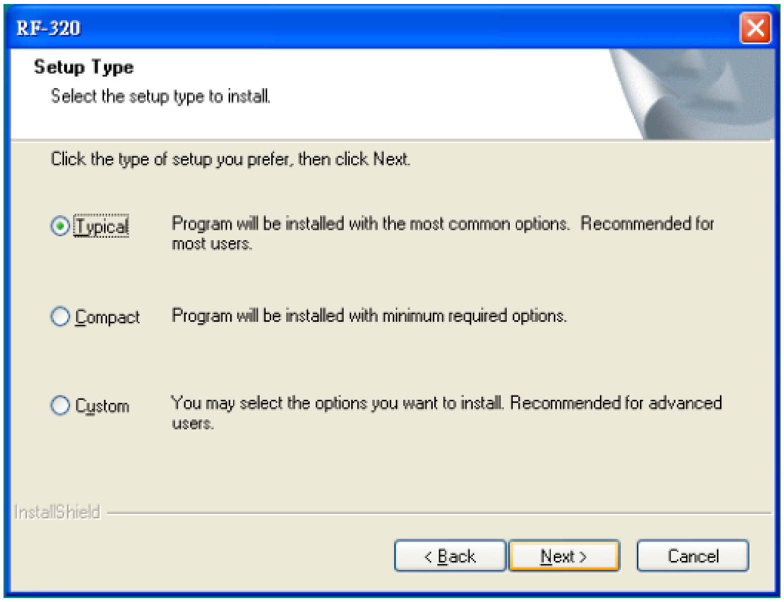


Figure 3-3: Setup Type Selection Screen

Step 6: The window shows the current settings for installing the RF320 (**Figure 3-4**).

Click **NEXT** to confirm the settings and continue the installation.

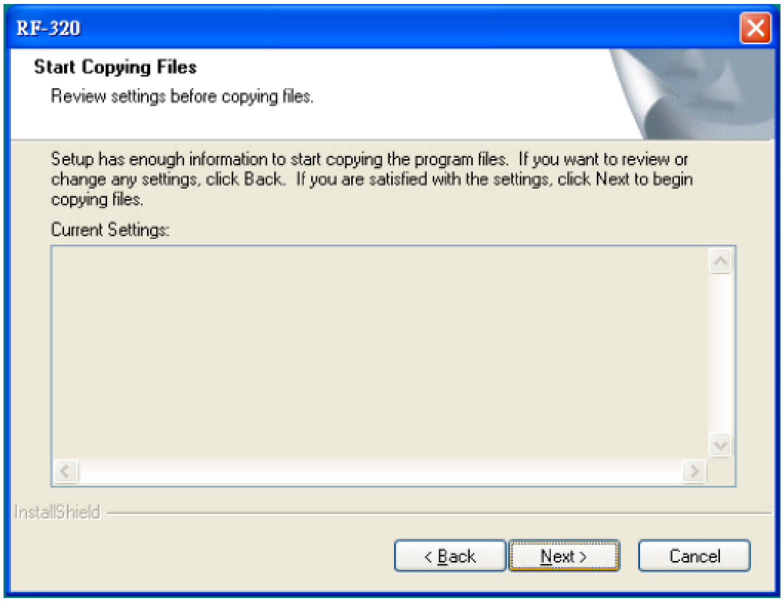
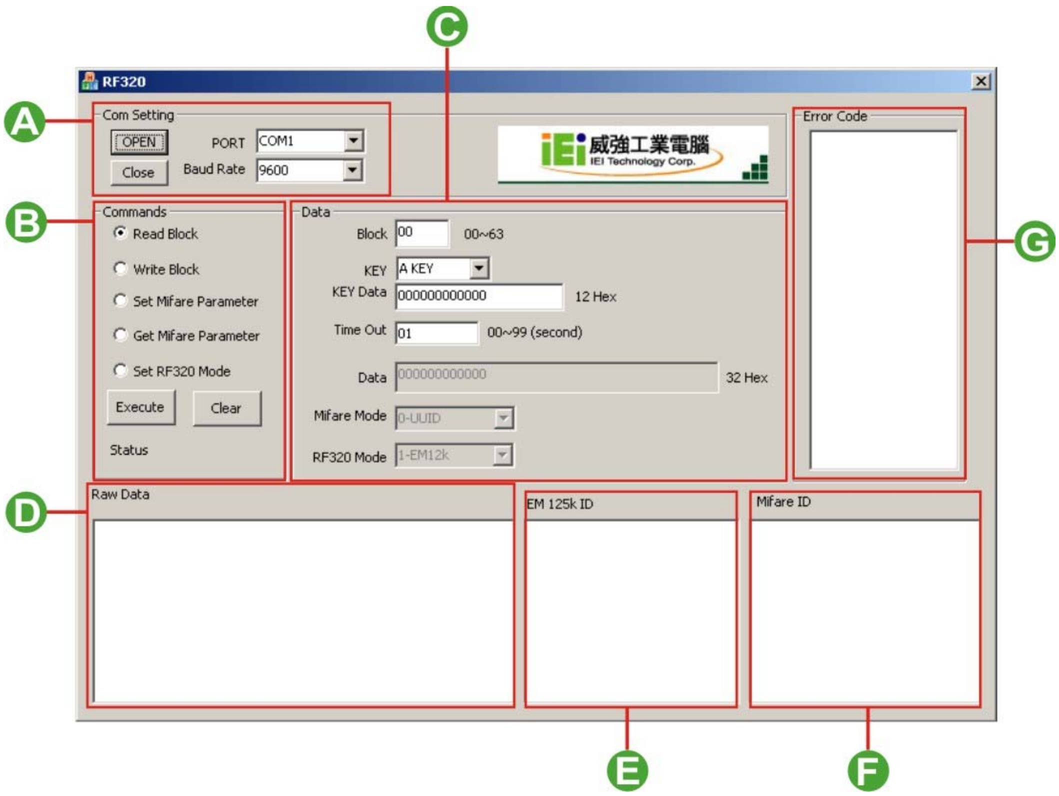


Figure 3-4: Current Settings Confirmation Screen

Step 7: Click **FINISH** to exit.

Step 8: To launch the RF320, click Start menu → Program File → IEI → RF320.

3.3 RF320 Interface Overview



A - COM Port Settings and Activation Area

Allows the user to select the serial port used by the ACT-408A-N270 to communicate with the RFID reader module.

B - Commands Area

Shows various request options for user to select.

C - Data Input Area

The data input area is where the user enters block number, key, key data, and other information required by certain commands.

D - Raw Data Display Area

Shows all communication logs and responses of the executed commands.

E - EM Card ID Display Area

Displays the EM card ID when the EM card is detected.

F - Mifare Card ID Display Area

Displays the Mifare card ID when the Mifare card is detected.

G Error Code Display Area

Shows the error message when an error occurs.

3.4 Serial Port (COM) Settings

After launching the RF320 RFID tool, the COM port settings have to be set correctly to enable the communication with the built-in RFID reader. Please follow the information below to setup the COM port settings.

Model	COM Port	Baud Rate
ACT-408A-N270	COM 2	19200

Table 3-1: RF320 COM Port Settings

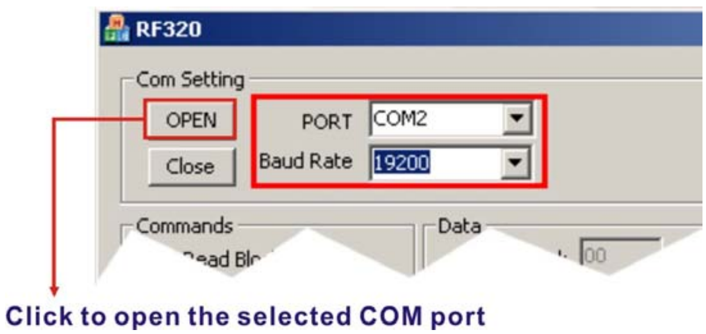
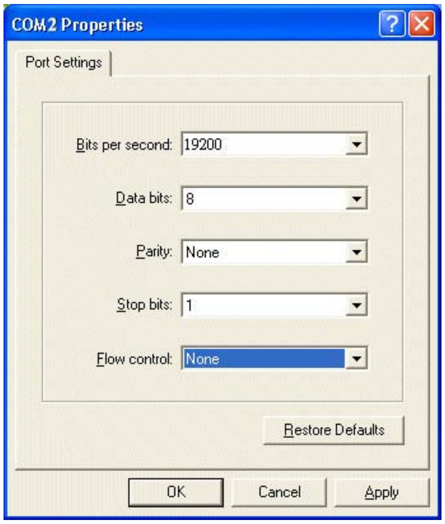


Figure 3-5: RF320 COM Port Settings

NOTE:

If the Hyper Terminal is used for communication, please setup the port properties as shown below.



Bits per second: 19200

Data bits: 8

Parity: None

Stop bits: 1

Flow control: None

3.5 RF320 Commands

The RF320 provides five commands, including:

- **Read Block**: read the block data from the Mifare/EM card
- **Write Block**: write the block data into the Mifare/EM card
- **Set Mifare Parameter**
- **Get Mifare Parameter**
- **Set RF320 Mode**

The following sections describe how to use these commands.

3.5.1 Read Block

To read the block data from a Mifare card, please follow the steps below.

Step 1: Select **Read Block** in the command area (**Figure 3-6**).

Step 2: Configure the data, including block, key, key data and time out (**Figure 3-6**).

Step 3: Click the **Execute** button to execute the command through the selected serial port (**Figure 3-6**). The raw data of this command shows in the Raw Data area in the format listed in **Table 3-2** and **Table 3-3**.

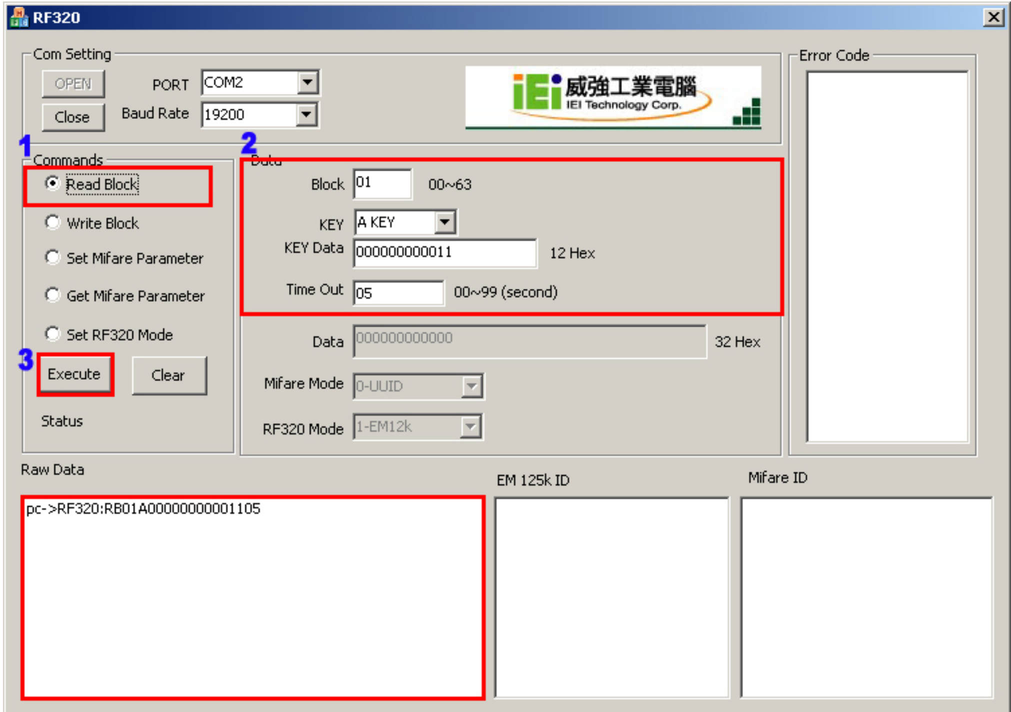


Figure 3-6: Read Block

Field	Command	Block	KEY	KEY Data	Time Out	End
Digit	2	2	1	12	2	1
Data	RB	00～63	A/B	000000000000 ～ (Hex) FFFFFFFFFFFF	00～99 (Second)	CR (0x0d)

Table 3-2: Read Block Raw Data Format

Status (2 digits)	Block Data (32 digits)	END (2 digits)
OK	32 bits (Hex)	CR,LF (0x0d,0x0a)
ER	Error Code (3 digits)	CR,LF (0x0d,0x0a)

Table 3-3: Read Block Response Format

3.5.2 Write Block

To write the block data into a Mifare card, please follow the steps below.

Step 4: Select **Write Block** in the command area (**Figure 3-7**).

Step 5: Configure the data, including block, key, key data, time out and data (**Figure 3-7**).

Step 6: Click the **Execute** button to execute the command through the selected serial port (**Figure 3-7**). The raw data of this command shows in the Raw Data area in the format listed in **Table 3-4** and **Table 3-5**.

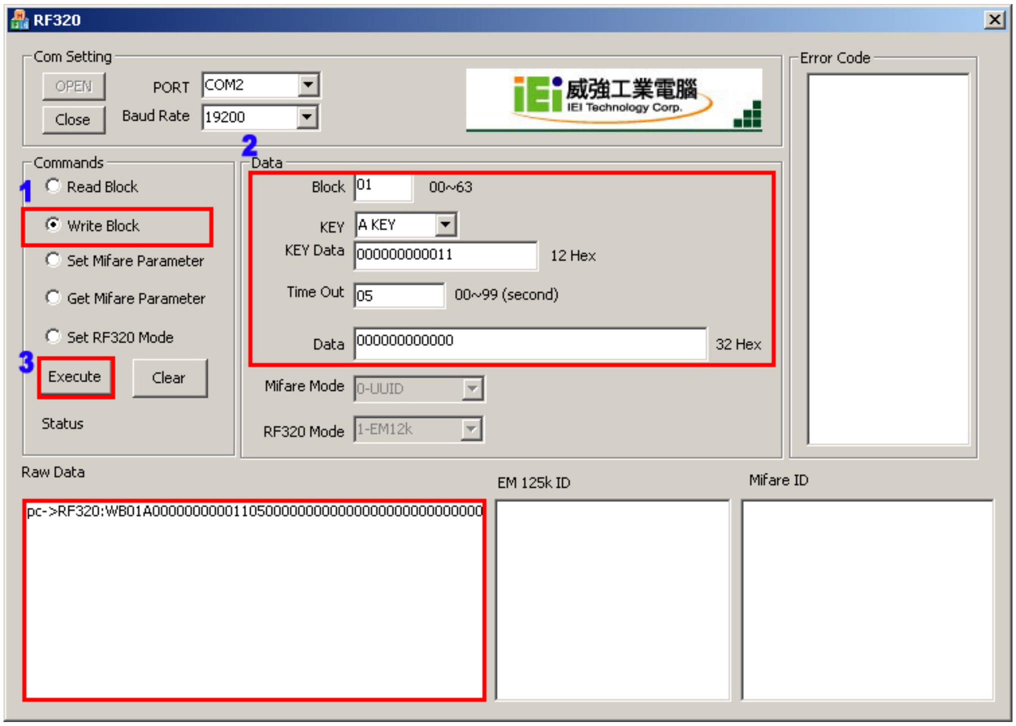


Figure 3-7: Write Block

Field	Command	Block	KEY	KEY Data	Time Out	Block Data	End
Digit	2	2	1	12	2	32	1
Data	WB	00~63	A/B	000000000000 ~ (Hex) FFFFFFFFFFFF	00~99 (Second)	32 digits Hex	CR (0x0d)

Table 3-4: Write Block Raw Data Format

Status (2 digits)	Block Data	END (2 digits)
OK	Null	CR,LF (0x0d,0x0a)
ER	Error Code (3 digits)	CR,LF (0x0d,0x0a)

Table 3-5: Write Block Response Format

3.5.3 Set Mifare Parameter

To set parameter of a Mifare card reader, please follow the steps below.

Step 7: Select **Set Mifare Parameter** in the command area (**Figure 3-8**).

Step 8: Select a Mifare mode.

- 0-UUID: read serial number only.
- 1-UUID & KEY A: read serial number and use "KEY A" to read "Block' data".
- 2-UUID & KEY B: read serial number and use "KEY B" to read "Block data".

Step 9: Configure the block number, and key data (**Figure 3-8**).

Step 10: Click the **Execute** button to execute the command through the selected serial port (**Figure 3-8**). The raw data of this command shows in the Raw Data area in the format listed in **Table 3-6** and **Table 3-7**.

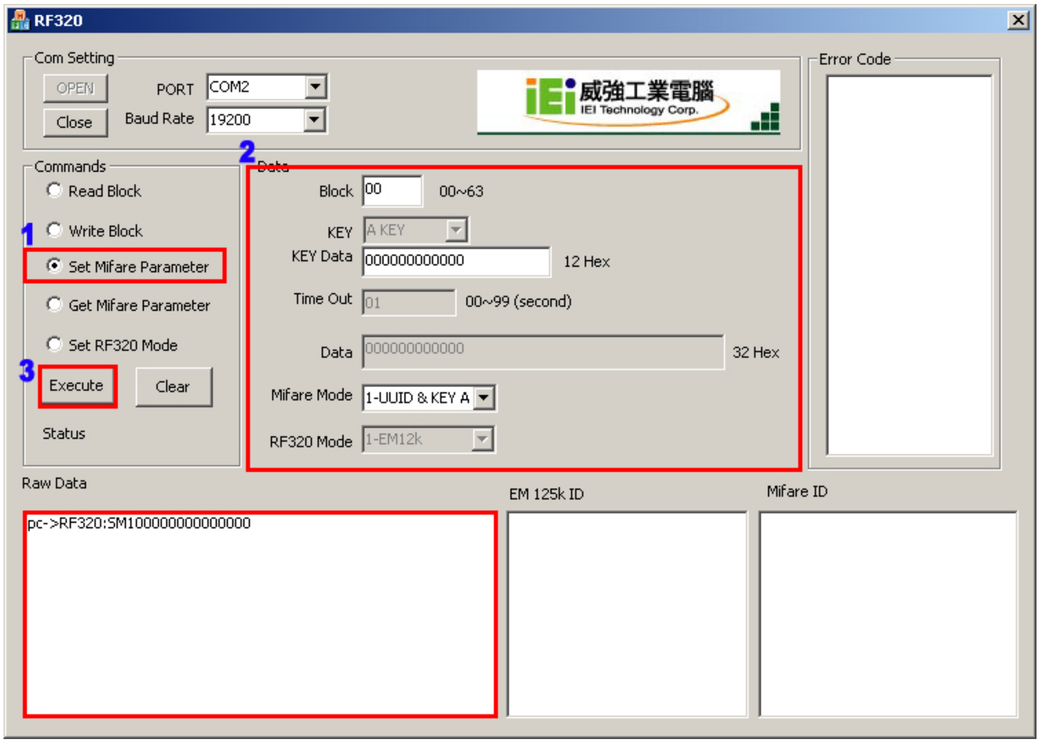


Figure 3-8: Set Mifare Parameter

Field	Command	Access Mode	Block	KEY Data	End
Digit	2	1	2	12	1
Data	SM	0~2	00~63	000000000000 ～ (Hex) FFFFFFFFFFFF	CR (0x0d)

Table 3-6: Set Mifare Parameter Raw Data Format

Status (2 digits)	Block Data	END (2 digits)
OK	Null	CR,LF (0x0d,0x0a)
ER	Error Code (3 digits)	CR,LF (0x0d,0x0a)

Table 3-7: Set Mifare Parameter Response Format

3.5.4 Get Mifare Parameter

To read the parameter of a Mifare card reader, please follow the steps below.

Step 11: Select **Get Mifare Parameter** in the command area (**Figure 3-9**).

Step 12: Click the **Execute** button to execute the command through the selected serial port (**Figure 3-9**). The raw data of this command shows in the Raw Data area in the format listed in **Table 3-8** and **Table 3-9**.

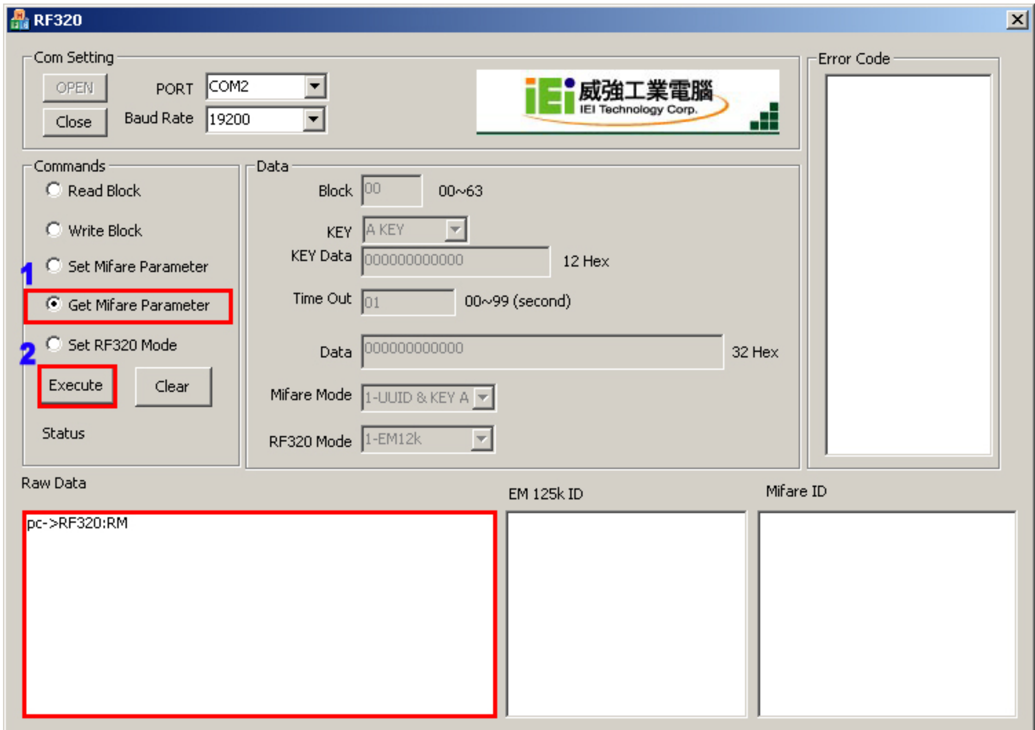


Figure 3-9: Get Mifare Parameter

Field	Command	End
Digit	2	1
Data	RM	CR (0x0d)

Table 3-8: Get Mifare Parameter Raw Data Format

Status (2 digits)	Block Data	END (2 digits)
OK	Access mode (1 digit) + Block (2 digits) + Mode (1 digit)	CR,LF (0x0d,0x0a)
ER	Error Code (3 digits)	CR,LF (0x0d,0x0a)

Table 3-9: Get Mifare Parameter Response Format

3.5.5 Set RF320 Mode

The Set RF320 Mode command is to set the type of RFID card for the RFID reader to detect. To set the type of RFID card, please follow the steps below.

Step 13: Select **Set RF320 Mode** in the command area (**Figure 3-10**).

Step 14: Select a RF320 mode.

- 1-EM12K: detect EM cards only.
- 2-Mifare: detect Mifare cards only.
- 3-EM and Mifare: detect both EM and Mifare cards.

Step 15: Click the **Execute** button to execute the command through the selected serial port (**Figure 3-10**). The raw data of this command shows in the Raw Data area in the format listed in **Table 3-10** and **Table 3-11**.

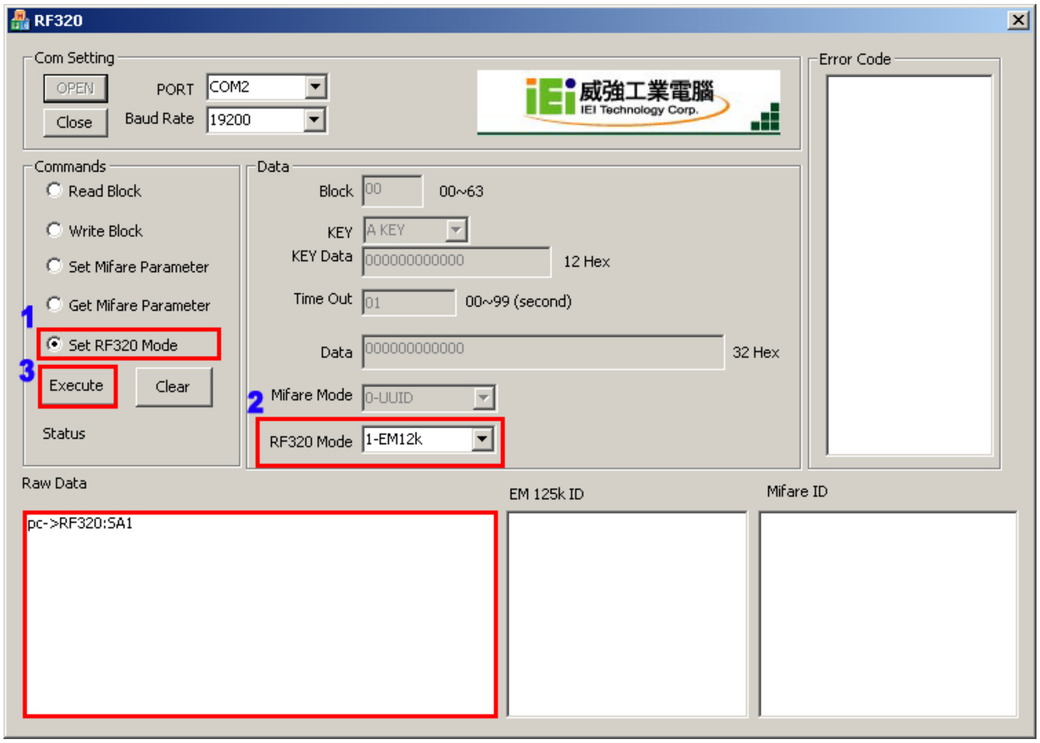


Figure 3-10: Set RF-320 Mode

Field	Command	Mode	End
Digit	2	1	1
Data	SA	1~3	CR (0x0d)

Table 3-10: Set RF320 Mode Raw Data Format

Status (2 digits)	Block Data	END (2 digits)
OK	Null	CR,LF (0x0d,0x0a)
ER	Error Code (3 digits)	CR,LF (0x0d,0x0a)

Table 3-11: Set RF320 Mode Response Format

Chapter

4

System Maintenance

4.1 System Maintenance Introduction

If the components of the ACT-408A-N270 fail they must be replaced. Components that can be replaced include:

- CF Module
- Wireless LAN module
- SO-DIMM module

Please contact the system reseller or vendor to purchase the replacement parts. Back cover removal instructions and component replacement for the ACT-408A-N270 are described below.

4.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the maintenance of the ACT-408A-N270 may result in permanent damage to the ACT-408A-N270 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ACT-408A-N270. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ACT-408A-N270 is accessed internally, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the ACT-408A-N270, place it on an antic-static pad. This reduces the possibility of ESD damaging the ACT-408A-N270.

- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

4.3 Turn off the Power

WARNING:

Failing to turn off the system before opening it can cause permanent damage to the system and serious or fatal injury to the user.

Before any maintenance procedures are carried out on the system, make sure the system is turned off.

4.4 Removing the Rear Panel

To access the ACT-408A-N270 internally, the rear panel must be removed. To remove the rear panel, please follow the steps below.

Step 1: **Follow all anti-static procedures**. See **Section 4.2**.

Step 2: **Turn off the power**. See **Section 4.3**.

Step 3: Put the front panel of the ACT-408A-N270 on a table.

Step 4: **Remove the Terminal Block connectors**. Remove the terminal block connectors (**Figure 4-1**) from the top and bottom panel. A flat headed screwdriver may be required to remove the connectors.

Step 5: **Remove the rear panel**. Remove the screws (**Figure 4-1**) from the rear panel and lift the rear panel off the ACT-408A-N270.

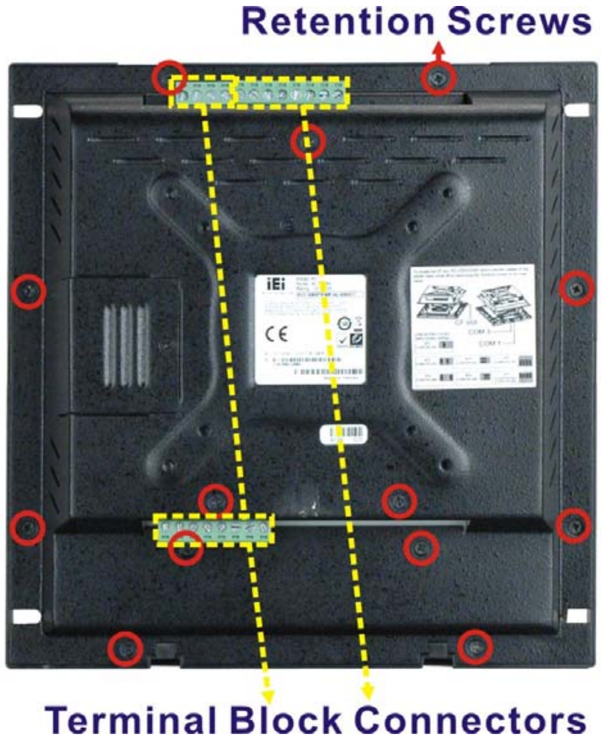


Figure 4-1: Rear Panel

4.5 Replacing Components

4.5.1 CF Card Replacement

The ACT-408A-N270 has one CF Type II slot. To replace the CF card, follow the instructions below.

Step 1: Follow all anti-static procedures. See Section 4.2.

Step 2: **Turn off the power**. See **Section 4.3**.

Step 3: Follow the steps described in **Section 2.7** to replace the CF card.

4.5.2 SO-DIMM Module Replacement

WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the ACT-408A-N270. Please make sure the purchased SO-DIMM complies with the memory specifications of the ACT-408A-N270.

To replace the SO-DIMM module, please follow the steps below.

Step 4: **Follow all anti-static procedures**. See **Section 4.2**.

Step 5: **Turn off the power**. See **Section 4.3**.

Step 6: **Remove the back panel**. See **Section 4.4**.

Step 7: **Locate the SO-DIMM module**. See **Figure 4-2**.

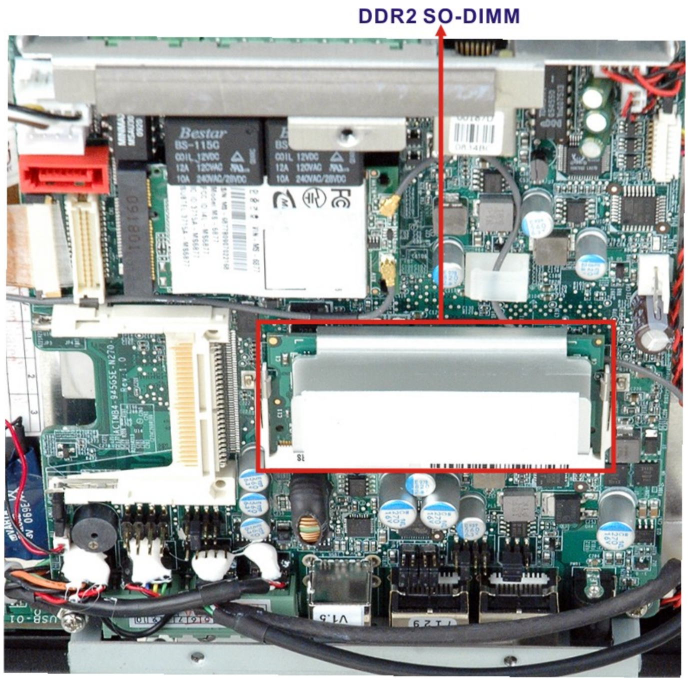


Figure 4-2: SO-DIMM Socket Location

Step 8: **Open the SO-DIMM socket arms**. Gently pull the arms of the SO-DIMM socket out and remove the old SO-DIMM.

Step 9: **Align the SO-DIMM with the socket**. The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket.

Step 10: **Insert the SO-DIMM**. Push the SO-DIMM chip into the socket at an angle (**Figure 4-3**).

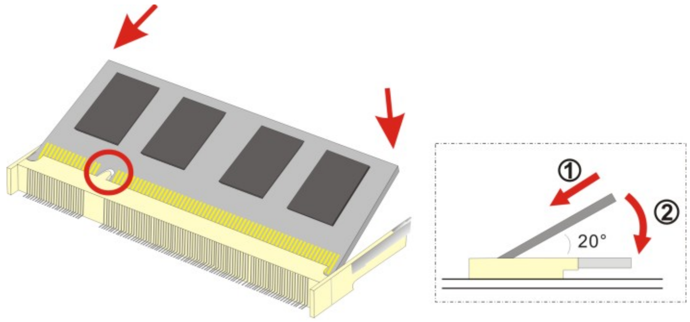


Figure 4-3: SO-DIMM Installation

Step 11: **Secure the SO-DIMM**. Push the SO-DIMM down. The clip into place and secure the SO-DIMM in the socket.

4.5.3 Wireless Module Replacement

To replace the wireless module, please follow the steps below.

Step 1: **Follow all anti-static procedures**. See **Section 4.2**.

Step 2: **Turn off the power**. See **Section 4.3**.

Step 3: **Remove the back panel**. See **Section 4.4**.

Step 4: **Locate the wireless module.** The wireless module is located below the CPU heat sink. See **Figure 4-4**.

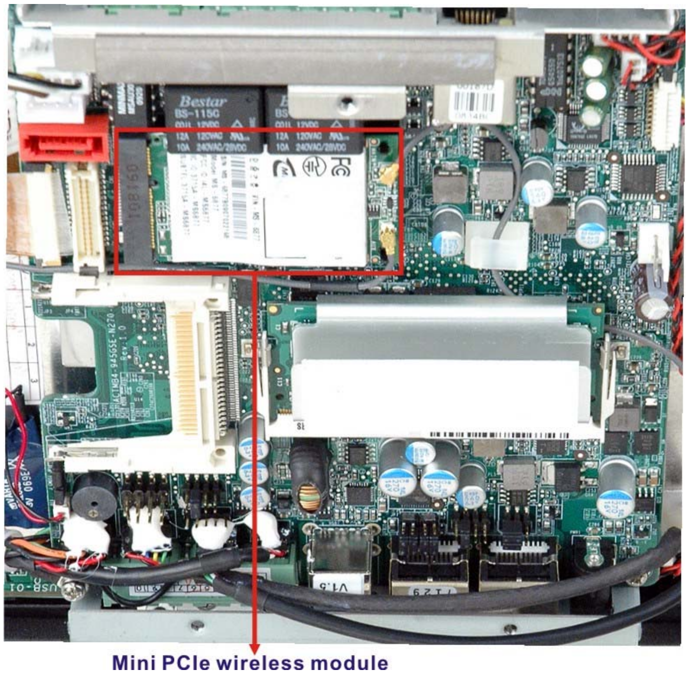


Figure 4-4: Wireless Module Location

Step 5: **Open the Mini PCIe card socket clips**. The Mini PCIe card socket has two clips that secure the Mini PCIe wireless module into the socket. Before the wireless module can be removed from the socket, the clips must be opened.

Step 6: **Remove the wireless module**. Once the two clips of the Mini PCIe card socket are open, remove the wireless module from the socket.

Step 7: **Align the new wireless module with the Mini PCIe card socket**. The wireless module must be oriented in such a way that the notch in the wireless module must be aligned with the plastic bridge in the socket.

Step 8: **Insert the wireless module**. Push the wireless module into the socket at an angle.

Step 9: **Secure the wireless module**. Push the wireless module down until the two clips into place, securing the card in place.

4.5.4 Motherboard Replacement

A user cannot replace a motherboard. If the motherboard fails it must be shipped back to IEI to be replaced. If the system motherboard has failed, please contact the system vendor, reseller or an IEI sales person directly.

Chapter 5

BIOS

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Plus & Minus	Changes the value
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu

Key	Function
F10 key	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **5**.

5.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- PCIPnP – Changes the advanced PCI/PnP Settings
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Chipset – Changes the chipset settings.
- Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (BIOS Menu 1) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.

```
                              BIOS SETUP UTILITY
   Main    Advanced   PCIPNP     Boot     Security  Chipset     Exit

 System Overview                                    Use [ENTER], [TAB]
 ____________________________________________       or [SHIFT-TAB] to
 AMIBIOS                                            select a field.
 Version     :08.00.15
 Build Date  :06/22/09                              Use [+] or [-] to
 ID:         :H454MR15                              configure system time.

 Processor
 Intel® Atom™ CPU N270  @ 1.60 GHz
 Speed        :1600 MHz
 Count        :1
                                                    ←→    Select Screen
 System Memory                                      ↑ ↓   Select Item
 Size          :1016MB                              Enter Go to SubScreen
                                                    F1    General Help
 System Time                    [20:09:10]          F10   Save and Exit
 System Time                    [Sun 01/27/2009]    ESC   Exit

             v02.61 ©Copyright 1985-2006, American Megatrends, Inc.
```

BIOS Menu 1: Main

➔ **System Overview**

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- AMI BIOS: Displays auto-detected BIOS information
  - **Version:** Current BIOS version
  - **Build Date:** Date the current BIOS version was made
  - **ID:** Installed BIOS ID
- Processor: Displays auto-detected CPU specifications
  - **Type:** Names the currently installed processor
  - **Speed:** Lists the processor speed
  - **Count:** The number of CPUs on the motherboard
- System Memory: Displays the auto-detected system memory.
  - **Size:** Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

5.3 Advanced

Use the **Advanced** menu (BIOS Menu 2) to configure the CPU and peripheral devices

```
                         BIOS SETUP UTILITY
  Main    Advanced   PCIPNP     Boot    Security   Chipset    Exit

Advanced Settings                                     | Configure CPU
_____________________________________________________ |
WARNING: Setting wrong values in below sections may cause
system to malfunction                                 |
                                                      |
> CPU Configuration                                   |
> IDE Configuration                                   |
> SuperIO Configuration                               |
> Hardware Health Configuration                       | ←→    Select Screen
> Power Configuration                                 | ↑ ↓   Select Item
> Remote Access Configuration                         | Enter Go to SubScreen
> USB Configuration                                   | F1    General Help
                                                      | F10   Save and Exit
                                                      | ESC   Exit
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```

BIOS Menu 2: Advanced

5.3.1 CPU Configuration

Use the **CPU Configuration** menu (BIOS Menu 3) to view detailed CPU specifications and configure the CPU.

```
                          BIOS SETUP UTILITY
   Main    Advanced   PCIPNP    Boot    Security  Chipset    Exit

 Configure Advanced CPU Settings
 Module Version:3F.10
 ____________________________________________________
 Manufacturer  :Intel®
 Intel® Atom™ CPU N270  @ 1.60 GHz
 Frequency     :1.60GHz
 FSB Speed     :532MHz                                  ←→    Select Screen
                                                        ↑ ↓   Select Item
 Cache L1      : 24KB                                   Enter Go to SubScreen
 Cache L2      : 512KB                                  F1    General Help
                                                        F10   Save and Exit
 Ratio Actual Value:12                                  ESC   Exit

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```

BIOS Menu 3: CPU Configuration

The CPU Configuration menu lists the following CPU details:

- Manufacturer: Lists the name of the CPU manufacturer
- Brand String: Lists the brand name of the CPU being used
- Frequency: Lists the CPU processing speed
- FSB Speed: Lists the FSB speed
- Cache L1: Lists the CPU L1 cache size
- Cache L2: Lists the CPU L2 cache size

5.3.2 IDE Configuration

Use the **IDE Configuration** menu (BIOS Menu 4) to change and/or set the configuration of the IDE devices installed in the system.

```
                         BIOS SETUP UTILITY
  Main    Advanced   PCIPNP    Boot    Security  Chipset    Exit

 IDE Configuration                                      Options
 ____________________________________________________
 ATA/IDE Configuration            [Compatible]          Disabled
   Legacy IDE Channels            [SATA Pri, PATA Sec]  Compatible
                                                        Enhanced
 > Primary IDE Master             : [Not Detected]
 > Primary IDE Slave              : [Not Detected]
 > Secondary IDE Master           : [Not Detected]      ←→    Select Screen
 > Secondary IDE Slave            : [Not Detected]      ↑ ↓   Select Item
                                                        Enter Go to SubScreen
                                                        F1    General Help
                                                        F10   Save and Exit
                                                        ESC   Exit

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```

BIOS Menu 4: IDE Configuration

➔ **ATA/IDE Configuration [Compatible]**

Use the **ATA/IDE Configuration** option to configure the ATA/IDE controller.

➔ **Disabled**		Disables the on-board ATA/IDE controller.
➔ **Compatible**	**DEFAULT**	The SATA drive is configured on an IDE channel.
➔ **Enhanced**		Both IDE and SATA channels are configured separately.

➔ **Legacy IDE Channels [SATA Pri, PATA Sec]**

Use the **Legacy IDE Channels** option to configure SATA devices as normal IDE devices.

➔ **SATA Only**	Only SATA drives are on the IDE channels. IDE drives are disabled
➔ **Reserved**	The IDE channels are reserved

- ➔ **SATA Pri, PATA Sec** — **DEFAULT** — SATA drives are configured on the Primary IDE channel. IDE drives on the Secondary IDE channel
- ➔ **PATA Only** — Only the IDE drives are enabled. SATA drives are disabled

5.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.

```
                         BIOS SETUP UTILITY
  Main    Advanced   PCIPNP    Boot    Security  Chipset    Exit

 Primary IDE Master                                   Select the type
 ____________________________________________________ of device connected
 Device        :Not Detected                          to the system
 ____________________________________________________
 Type                                [Auto]
 LBA/Large Mode                      [Auto]
 Block (Multi-Sector Transfer)       [Auto]
 PIO Mode                            [Auto]           ←      Select Screen
 DMA Mode                            [Auto]           ↑ ↓    Select Item
 S.M.A.R.T.                          [Auto]           +-     Change Option
 32Bit Data Transfer                 [Enabled]        F1     General Help
                                                      F10    Save and Exit
                                                      ESC    Exit

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```

BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ Auto-Detected Drive Parameters

The “grayed-out” items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- Device: Lists the device type (e.g. hard disk, CD-ROM etc.)
- Type: Indicates the type of devices a user can manually select
- Vendor: Lists the device manufacturer
- Size: List the storage capacity of the device.
- LBA Mode: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.

- Block Mode: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- PIO Mode: Indicates the PIO mode of the installed device.
- Async DMA: Indicates the highest Asynchronous DMA Mode that is supported.
- Ultra DMA: Indicates the highest Synchronous DMA Mode that is supported.
- S.M.A.R.T.: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- 32Bit Data Transfer: Enables 32-bit data transfer.

→ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

→ **Not Installed** BIOS is prevented from searching for an IDE disk drive on the specified channel.

→ **Auto** **DEFAULT** The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.

→ **CD/DVD** The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.

→ **ARMD** This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

ZIP

LS-120

→ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

→ **Disabled** BIOS is prevented from using the LBA mode control on the specified channel.

→ **Auto** DEFAULT BIOS auto detects the LBA mode control on the specified channel.

→ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

→ **Disabled** BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.

→ **Auto** DEFAULT BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

→ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

→ **Auto** DEFAULT BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

→ **0** PIO mode 0 selected with a maximum transfer rate of 3.3 MB/s

→ **1** PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s

→ **2** PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s

- **3** PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s
- **4** PIO mode 4 selected with a maximum transfer rate of 16.6 MB/s (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

DMA Mode [Auto]

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

- **Auto** **DEFAULT** BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
- **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1 MB/s
- **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2 MB/s
- **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3 MB/s
- **MWDMA0** Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2 MB/s
- **MWDMA1** Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3 MB/s
- **MWDMA2** Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6 MB/s
- **UDMA0** Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6 MB/s
- **UDMA1** Ultra DMA mode 1 selected with a maximum data transfer rate of 25 MB/s
- **UDMA2** Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3 MB/s

- → **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
- → **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
- → **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

→ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

- → **Auto** **DEFAULT** BIOS auto detects HDD SMART support.
- → **Disabled** Prevents BIOS from using the HDD SMART feature.
- → **Enabled** Allows BIOS to use the HDD SMART feature

→ **32Bit Data Transfer [Enabled]**

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

- → **Disabled** Prevents the BIOS from using 32-bit data transfers.
- → **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

5.3.3 Super I/O Configuration

Use the **Super I/O Configuration** menu (BIOS Menu 6) to set or change the configurations for the FDD controllers, parallel ports and serial ports.

```
                             BIOS SETUP UTILITY
  Main    Advanced   PCIPNP    Boot    Security  Chipset     Exit

 Configure Super I/O Chipset                           Allows BIOS to select
                                                       Serial Port1 Base
 ______________________________________________        Addresses
 Serial Port1 Address             [3F8/IRQ4]
 Serial Port3 Address             [3E8]
   Serial Port3 IRQ               [11]
 Select RS232 or RS422/485        [RS232]




                                                       ←→    Select Screen
                                                       ↑ ↓   Select Item
                                                       Enter Go to SubScreen
                                                       F1    General Help
                                                       F10   Save and Exit
                                                       ESC   Exit
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```

BIOS Menu 6: Super I/O Configuration

➔ **Serial Port1 Address [3F8/IRQ4]**

Selects the serial port base address.

- ➔ **Disabled** — No base address
- ➔ **3F8/IRQ4** **DEFAULT** — I/O address 3F8 and interrupt address IRQ4
- ➔ **3E8/IRQ4** — I/O address 3E8 and interrupt address IRQ4
- ➔ **2E8/IRQ3** — I/O address 2E8 and interrupt address IRQ3

➔ **Serial Port3 Address [3E8]**

Selects the serial port base address.

- ➔ **Disabled** — No base address
- ➔ **3E8** **DEFAULT** — I/O address 3E8

→ **2E8** I/O address 2E8

→ **2F0** I/O address 2F0

→ **2E0** I/O address 2E0

→ **Serial Port3 IRQ [11]**

Selects the serial port interrupt address.

→ **10** IRQ address 10

→ **11** **DEFAULT** IRQ address 11

→ **Serial Port4 Address [2E8]**

Selects the serial port base address.

→ **Disabled** No base address

→ **3E8** I/O address 3E8

→ **2E8** **DEFAULT** I/O address 2E8

→ **2F0** I/O address 2F0

→ **2E0** I/O address 2E0

→ **Serial Port4 IRQ [10]**

Selects the serial port interrupt address.

→ **10** IRQ address 10

→ **11** **DEFAULT** IRQ address 11

→ **Serial Port5 Address [2F0]**

Selects the serial port base address.

→ **Disabled** No base address

→ **3E8** I/O address 3E8

- ➔ **2E8** I/O address 2E8
- ➔ **2F0** **DEFAULT** I/O address 2F0
- ➔ **2E0** I/O address 2E0

➔ **Serial Port5 IRQ [10]**

Selects the serial port interrupt address.

- ➔ **10** IRQ address 10
- ➔ **11** **DEFAULT** IRQ address 11

5.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (BIOS Menu 7) shows the operating temperature, fan speeds and system voltages.

```
                              BIOS SETUP UTILITY
  Main     Advanced    PCIPNP     Boot     Security   Chipset     Exit

 Hardware Health Event Monitoring                   Fan configuration
 ___________________________________________________ mode setting
 CPU FAN  Mode Setting             [Full On mode]
 ___________________________________________________
 CPU Temperature                   :57°C/132°F
 System Temperature                :47°C/116°F

 CPU Speed                         :N/A

 CPU Core                          :1.088 V
 +1.05V                            :1.040 V
 +3.30V                            :3.296 V
 +5.00V                            :4.945 V
 +12.0V                            :11.904 V
 +1.50V                            :1.456 V          ←→    Select Screen
 +1.80V                            :1.792 V          ↑↓    Select Item
 5VSB                              :4.972 V          Enter Go to SubScreen
 VBAT                              :3.200 V          F1    General Help
                                                     F10   Save and Exit
                                                     ESC   Exit
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```

BIOS Menu 7: Hardware Health Configuration

→ **Mode Setting [Full On Mode]**

Use the **Mode Setting** option to configure the second fan.

→ **Full On Mode** DEFAULT Fan is on all the time

→ **Automatic mode** The fan adjusts its speed using these settings:

Temp. Limit of OFF

Temp. Limit of Start

Fan Start PWM

Slope PWM 1

→ **PWM Manual mode** The fan spins at the speed set in:

Fan PWM control

→ **Temp. Limit of OFF [000]**

WARNING:

CPU failure can result if this value is set too high

The fan will turn off if the temperature falls below this value.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ **Temp. Limit of Start [020]**

WARNING:

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

➔ **Start PWM [070]**

This is the initial speed of the fan when it first starts spinning.

- PWM Minimum Mode: 0
- PWM Maximum Mode: 127

➔ **Slope PWM [1 PWM]**

A greater value will increase the fan speed in large amounts. A smaller value will increase the speed more gradually.

- 0 PWM
- 1 PWM
- 2 PWM
- 4 PWM
- 8 PWM
- 16 PWM
- 32 PWM
- 64 PWM

➔ **CPU Fan PWM Control [070]**

This value specifies the speed of the fan.

- PWM Minimum Mode: 0
- PWM Maximum Mode: 127

5.3.5 Power Configuration

The **Power Configuration** menu (BIOS Menu 8) allows the advanced power management options to be configured.

```
                         BIOS SETUP UTILITY
   Main    Advanced   PCIPNP    Boot    Security  Chipset    Exit

 > ACPI Configuration
 > APM Configuration




                                                     ←→    Select Screen
                                                     ↑ ↓   Select Item
                                                     Enter Go to SubScreen
                                                     F1    General Help
                                                     F10   Save and Exit
                                                     ESC   Exit
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```

BIOS Menu 8: APM Configuration

5.3.6 ACPI Configuration

Use the **ACPI Configuration** menu (**BIOS Menu 9**) to select the ACPI state when the system is suspended.

```
                          BIOS SETUP UTILITY
  Main    Advanced   PCIPNP    Boot    Security   Chipset    Power    Exit

 ACPI Settings
 ____________________________________________________
 Suspend Mode                      [S1 (POS)]




                                                      ←→    Select Screen
                                                      ↑ ↓   Select Item
                                                      Enter Go to SubScreen
                                                      F1    General Help
                                                      F10   Save and Exit
                                                      ESC   Exit

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```

BIOS Menu 9: General ACPI Configuration

➔ **Suspend Mode [S1(POS)]**

Use the **Suspend Mode** option to specify the sleep state the system enters when it is not being used.

➔ **S1 (POS)** **DEFAULT** The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (STR)** System appears off. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

5.3.7 APM Configuration

The **APM Configuration** menu (**BIOS Menu 10**) allows the advanced power management options to be configured.

```
                          BIOS SETUP UTILITY
  Main     Advanced   PCIPNP     Boot    Security   Chipset     Exit

APM Configuration                                  Go into On/Off, or
---------------------------------------------      Suspend when Power
Power Button Mode                [On/Off]          button is pressed

Advanced Resume Events Controls
  Resume On Ring                 [Disabled]
  Resume on PCI-Express Wake#    [Enabled]
  Resume on RTC Alarm            [Disabled]        ←→     Select Screen
                                                   ↑ ↓    Select Item
                                                   Enter  Go to SubScreen
                                                   F1     General Help
                                                   F10    Save and Exit
                                                   ESC    Exit

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```

BIOS Menu 10: APM Configuration

➔ **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

➔ **On/Off** DEFAULT When the power button is pressed the system is either turned on or off

➔ **Suspend** When the power button is pressed the system goes into suspend mode

➔ **Resume on Keyboard/Mouse [Disabled]**

Use the **Resume on Keyboard/Mouse** BIOS option to enable activity on either the keyboard or mouse to rouse the system from a suspend or standby state. That is, the system is roused when the mouse is moved or a button on the keyboard is pressed.

➔	**Disabled**	**DEFAULT**	Wake event not generated by activity on the keyboard or mouse
➔	**Resume On KeyBoard**		Wake event not generated by activity on the keyboard
➔	**Resume On Mouse**		Wake event not generated by activity on the mouse
➔	**Enabled**		Wake event generated by activity on the keyboard or mouse

➔ **Resume on Ring [Disabled]**

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

➔	**Disabled**	**DEFAULT**	Wake event not generated by an incoming call
➔	**Enabled**		Wake event generated by an incoming call

➔ **Resume on PCI-Express WAKE# [Enabled]**

Use the **Resume PCI-Express WAKE#** BIOS option to enable activity on the PCI-Express WAKE# signal to rouse the system from a suspend or standby state.

➔	**Disabled**		Wake event not generated by PCI-Express WAKE# signal activity
➔	**Enabled**	**DEFAULT**	Wake event generated by PCI-Express WAKE# signal activity

➔ **Resume On RTC Alarm [Disabled]**

Use the **Resume On RTC Alarm** option to specify the time the system should be roused from a suspended state.

➔ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

➔ **Enabled** If selected, the following appears with values that can be selected:

➔ **RTC Alarm Date (Days)**

➔ **System Time**

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.3.8 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 11**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.

```
                              BIOS SETUP UTILITY
   Main     Advanced    PCIPNP     Boot     Security   Chipset     Exit

 Configure Remote Access type and parameters
 ____________________________________________________
 Remote Access                     [Disabled]

 Serial port number                [COM1]
      Base Address, IRQ            [3F8H, 4]
 Serial Port Mode                  [115200 8,n,1]
 Redirection After BIOS POST       [Always]           ←→    Select Screen
 Terminal Type                     [ANSI]             ↑ ↓   Select Item
                                                      Enter Go to SubScreen
                                                      F1    General Help
                                                      F10   Save and Exit
                                                      ESC   Exit

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```

BIOS Menu 11: Remote Access Configuration

➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

- ➔ **Disabled** **DEFAULT** Remote access is disabled.
- ➔ **Enabled** Remote access configuration options shown below appear:
  - Serial Port Number
  - Serial Port Mode
  - Flow Control
  - Redirection after BIOS POST
  - Terminal Type
  - VT-UTF8 Combo Key Support

  These configuration options are discussed below.

➔ Serial Port Number [COM1]

Use the **Serial Port Number** option to select the serial port used for remote access.

- ➔ **COM1** **DEFAULT** System is remotely accessed through COM1
- ➔ **COM2** System is remotely accessed through COM2

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ Base Address, IRQ [2F8h,3]

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ Serial Port Mode [115200 8,n,1]

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1

- 09600 8,n,1

NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

➔ Flow Control [None]

Use the **Flow Control** option to report the flow control method for the console redirection application.

- ➔ **None** DEFAULT No control flow,
- ➔ **Hardware** Hardware is set as the console redirection
- ➔ **Software** Software is set as the console redirection

➔ Redirection After BIOS POST [Always]

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

- ➔ **Disabled** The console is not redirected after POST
- ➔ **Boot Loader** Redirection is active during POST and during Boot Loader
- ➔ **Always** DEFAULT Redirection is always active (Some OSes may not work if set to Always)

➔ Terminal Type [ANSI]

Use the **Terminal Type** BIOS option to specify the remote terminal type.

- ➔ **ANSI** DEFAULT The target terminal type is ANSI
- ➔ **VT100** The target terminal type is VT100
- ➔ **VT-UTF8** The target terminal type is VT-UTF8

→ **VT-UTF8 Combo Key Support [Disabled]**

Use the **VT-UFT8 Combo Key Support** option to enable additional keys that are not provided by VT100 for the PC 101 keyboard.

The VT100 Terminal Definition is the standard convention used to configure and conduct emergency management tasks with UNIX-based servers. VT100 does not support all keys on the standard PC 101-key layout, however. The VT-UTF8 convention makes available additional keys that are not provided by VT100 for the PC 101 keyboard.

→ **Disabled** **DEFAULT** Disables the VT-UTF8 terminal keys

→ **Enabled** Enables the VT-UTF8 combination key. Support for ANSI/VT100 terminals

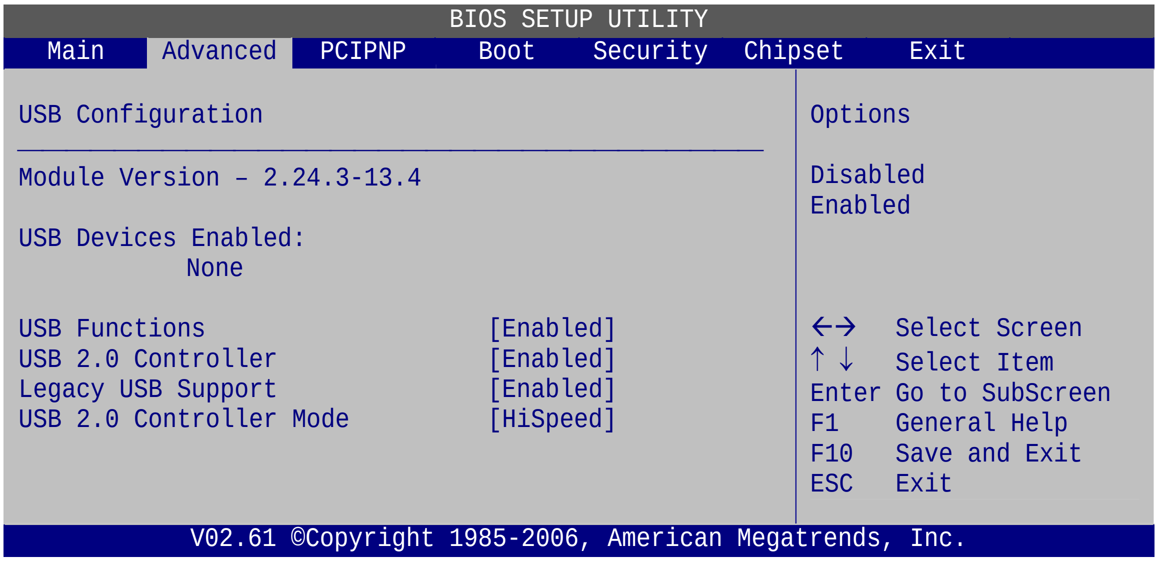
→ **Sredir Memory Display Delay [Disabled]**

Use the **Sredir Memory Display Delay** option to select the delay before memory information is displayed. Configuration options are listed below

- No Delay DEFAULT
- Delay 1 sec
- Delay 2 sec
- Delay 4 sec

5.3.9 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 12**) to read USB configuration information and configure the USB settings.



BIOS Menu 12: USB Configuration

➔ **USB Configuration**

The **USB Configuration** field shows the system USB configuration. The items listed are:

- Module Version: x.xxxxx.xxxxx

➔ **USB Devices Enabled**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ **USB Function [Enabled]**

Use the **USB Function** BIOS option to enable or disable USB function support.

➔ **Disabled** USB function support disabled

➔ **Enabled** **DEFAULT** USB function support enabled

→ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

→ **Disabled** USB 2.0 controller disabled

→ **Enabled** **DEFAULT** USB 2.0 controller enabled

→ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

→ **Disabled** Legacy USB support disabled

→ **Enabled** **DEFAULT** Legacy USB support enabled

→ **Auto** Legacy USB support disabled if no USB devices are connected

→ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

→ **FullSpeed** The controller is capable of operating at 12 Mb/s

→ **HiSpeed** **DEFAULT** The controller is capable of operating at 480 Mb/s

5.4 PCI/PnP

Use the **PCI/PnP** menu (**BIOS Menu 13**) to configure advanced PCI and PnP settings.

WARNING!

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.

```
                          BIOS SETUP UTILITY
  Main    Advanced   PCIPNP    Boot    Security  Chipset    Exit

 Advanced PCI/PnP Settings                        Available: Specified IRQ
 ____________________________________________     is available to be use
 IRQ3                            [Reserved]       the PCI/PnP devices
 IRQ4                            [Reserved]       Reserved: Specified IRQ
 IRQ5                            [Available]      is reserved for use by
 IRQ7                            [Available]      legacy ISA devices
 IRQ9                            [Available]
 IRQ10                           [Reserved]
 IRQ11                           [Reserved]
 IRQ14                           [Available]
 IRQ15                           [Available]

 DMA Channel 0                   [Available]      ←→    Select Screen
 DMA Channel 1                   [Available]      ↑↓    Select Item
 DMA Channel 3                   [Available]      Enter Go to SubScreen
 DMA Channel 5                   [Available]      F1    General Help
 DMA Channel 6                   [Available]      F10   Save and Exit
 DMA Channel 7                   [Available]      ESC   Exit

 Reserved Memory Size            [Disabled]

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```

BIOS Menu 13: PCI/PnP Configuration

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

- → **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices
- → **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

→ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

- → **Available** **DEFAULT** The specified DMA is available to be used by PCI/PnP devices
- → **Reserved** The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

➔ Reserved Memory Size [Disabled]

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔	**Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔	**16K**		16 KB reserved for legacy ISA devices
➔	**32K**		32 KB reserved for legacy ISA devices
➔	**64K**		54 KB reserved for legacy ISA devices

5.5 Boot

Use the **Boot** menu (**BIOS Menu 14**) to configure system boot options.

```
                              BIOS SETUP UTILITY
  Main    Advanced   PCIPNP      Boot    Security   Chipset     Exit

 Boot Settings                                      Configure settings
 ____________________________________________       during system boot.
 > Boot Settings Configuration

 > Boot Device Priority
 > Hard Disk Drives
 > CD/DVD Drives
 > Removable Drives                                 ←→     Select Screen
                                                    ↑ ↓    Select Item
                                                    Enter  Go to SubScreen
                                                    F1     General Help
                                                    F10    Save and Exit
                                                    ESC    Exit

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```

BIOS Menu 14: Boot

5.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 15**) to configure advanced system boot options.

```
                          BIOS SETUP UTILITY
  Main    Advanced   PCIPNP     Boot     Security  Chipset    Exit

 Boot Settings Configuration                   | Allows BIOS to skip
 ______________________________________________| certain tests while
                                               | booting. This will
 Quick Boot                      [Enabled]     | decrease the time
 Quiet Boot                      [Enabled]     | needed to boot the
 AddOn ROM Display Mode          [Force BIOS]  | system.
 Bootup Num-Lock                 [On]          |
 Boot From LAN Support           [Disabled]    | ←→    Select Screen
 Spread Spectrum Function        [Disabled]    | ↑ ↓   Select Item
                                               | Enter Go to SubScreen
                                               | F1    General Help
                                               | F10   Save and Exit
                                               | ESC   Exit

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```

BIOS Menu 15: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled** — No POST procedures are skipped

➔ **Enabled** — **DEFAULT** — Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Enabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled** — **DEFAULT** — Normal POST messages displayed

➔ **Enabled** — OEM Logo displayed instead of POST messages

→ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

→ **Force BIOS** DEFAULT The system forces third party BIOS to display during system boot.

→ **Keep Current** The system displays normal information during system boot.

→ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

→ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

→ **On** DEFAULT Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

→ **Boot From LAN Support [Disabled]**

Use the **BOOT From LAN Support** option to enable the system to be booted from a remote system.

→ **Disabled** DEFAULT Cannot be booted from a remote system through the LAN

→ **Enabled** DEFAULT Can be booted from a remote system through the LAN

→ **Spread Spectrum Mode [Disabled]**

The **Spread Spectrum Mode** option can help to improve CPU EMI issues.

→ **Disabled** **DEFAULT** The spread spectrum mode is disabled

→ **Enabled** The spread spectrum mode is enabled

5.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 16**) to specify the boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.

```
                          BIOS SETUP UTILITY
   Main    Advanced   PCIPNP      Boot     Security  Chipset    Exit

 Boot Device Priority                               Specifies the boot
 ____________________________________________       sequence from the
 > 1st Boot Device              [1st Boot Device]   available devices.
 > 2nd Boot Device              [2nd Boot Device]
 > 3rd Boot Device              [3rd Boot Device]

                                                    ←→    Select Screen
                                                    ↑ ↓   Select Item
                                                    Enter Go to SubScreen
                                                    F1    General Help
                                                    F10   Save and Exit
                                                    ESC   Exit
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```

BIOS Menu 16: Boot Device Priority Settings

5.5.3 Hard Disk Drives

Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs. Only installed hard drives are shown.

```
                              BIOS SETUP UTILITY
   Main     Advanced    PCIPNP      Boot     Security   Chipset     Exit

 Hard Disk Drives                                      Specifies the boot
                                                       sequence from the
 ___________________________________________________   available devices.
 > 1st Drive                        [Hard Drive 1]
 > 2nd Drive                        [Hard Drive 2]
 > 3rd Drive                        [Hard Drive 3]


                                                       ←→    Select Screen
                                                       ↑ ↓   Select Item
                                                       Enter Go to SubScreen
                                                       F1    General Help
                                                       F10   Save and Exit
                                                       ESC   Exit
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```

BIOS Menu 17: Hard Disk Drives

5.5.4 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 18**) to specify the boot sequence of the removable drives. Only connected drives are shown.

```
                         BIOS SETUP UTILITY
 Main    Advanced   PCIPNP     Boot    Security  Chipset     Exit

Hard Disk Drives                                      Specifies the boot
                                                      sequence from the
____________________________________________________  available devices.
> 1st Drive                    [Removable Drive 1]
> 2nd Drive                    [Removable Drive 2]
> 3rd Drive                    [Removable Drive 3]

                                                      ←→    Select Screen
                                                      ↑ ↓   Select Item
                                                      Enter Go to SubScreen
                                                      F1    General Help
                                                      F10   Save and Exit
                                                      ESC   Exit

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```

BIOS Menu 18: Removable Drives

5.5.5 CD/DVD Drives

Use the **CD/DVD Drives** menu to specify the boot sequence of the available CD/DVD drives. When the menu is opened, the CD drives and DVD drives connected to the system are listed as shown below:

- 1st Drive [CD/DVD: PM-(part ID)]
- 2nd Drive [HDD: PS-(part ID)]
- 3rd Drive [HDD: SM-(part ID)]
- 4th Drive [HDD: SM-(part ID)]

NOTE:

Only the drives connected to the system are shown. For example, if only two CDs or DVDs are connected only "**1st Drive**" and "**2nd Drive**" are listed.

The boot sequence from the available devices is selected. If the “**1st Drive**” option is selected a list of available CD/DVD drives is shown. Select the first CD/DVD drive the system boots from. If the “**1st Drive**” is not used for booting this option may be disabled.

```
                         BIOS SETUP UTILITY
  Main    Advanced   PCIPNP     Boot     Security   Chipset     Exit

 Hard Disk Drives                                   Specifies the boot
                                                    sequence from the
 ____________________________________________       available devices.
 > 1st Drive                     [CD/DVD 1]
 > 2nd Drive                     [CD/DVD 2]
 > 3rd Drive                     [CD/DVD 3]

                                                    ←→    Select Screen
                                                    ↑ ↓   Select Item
                                                    Enter Go to SubScreen
                                                    F1    General Help
                                                    F10   Save and Exit
                                                    ESC   Exit

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```

BIOS Menu 19: CD/DVD Drives

5.6 Security

Use the **Security** menu (**BIOS Menu 20**) to set system and user passwords.

```
                         BIOS SETUP UTILITY
  Main    Advanced   PCIPNP     Boot     Security   Chipset     Exit

 Security Settings

 ____________________________________________
 Supervisor Password     :Not Installed
 User Password           :Not Installed

 Change Supervisor Password
 Change User Password
                                                    ←→    Select Screen
                                                    ↑ ↓   Select Item
                                                    Enter Go to SubScreen
                                                    F1    General Help
                                                    F10   Save and Exit
                                                    ESC   Exit

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```

BIOS Menu 20: Security

→ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

→ **Change User Password**

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

5.7 Chipset

Use the **Chipset** menu (**BIOS Menu 21**) to access the Northbridge and Southbridge configuration menus

WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

```
                              BIOS SETUP UTILITY
   Main     Advanced   PCIPNP     Boot     Security   Chipset    Exit

 Advanced Chipset
 ____________________________________________________
 > Northbridge Configuration
 > Southbridge Configuration

                                                      ←→    Select Screen
                                                      ↑ ↓   Select Item
                                                      Enter Go to SubScreen
                                                      F1    General Help
                                                      F10   Save and Exit
                                                      ESC   Exit

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```

BIOS Menu 21: Chipset

5.7.1 Northbridge Configuration

Use the **Northbridge Chipset Configuration** menu (**BIOS Menu 22**) to configure the Northbridge chipset.

```
                              BIOS SETUP UTILITY
   Main     Advanced   PCIPNP     Boot     Security   Chipset    Exit

 Northbridge Configuration
 ____________________________________________________
 Memory Hole                      [Disabled]
 Internal Graphics Mode Select    [Enabled, 8MB]

 Video Function Configuration
 ____________________________________________________
 DVMT Mode Select                 [DVMT Mode]        ←→    Select Screen
   DVMT/FIXED Memory              [128MB]            ↑ ↓   Select Item
                                                     Enter Go to SubScreen
 Boot Display Device              [LFP]              F1    General Help
   Sec. Display Device            [CRT]              F10   Save and Exit
 LFP Panel Type                   [by H/W]           ESC   Exit
 LFP Current Jumper Setting       [1024x768 18b]
 LFP Brightness Control           [127]

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```

BIOS Menu 22: Northbridge Chipset Configuration

➔ Memory Hole [Disabled]

Use the **Memory Hole** option to reserve memory space between 15 MB and 16 MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

- ➔ **Disabled** DEFAULT Memory is not reserved for ISA expansion cards
- ➔ **15 MB–16 MB** Between 15 MB and 16 MB of memory is reserved for ISA expansion cards

➔ Internal Graphics Mode Select [Enable, 8 MB]

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

- ➔ **Disable** Disabled the onboard graphics
- ➔ **Enable, 1 MB** Dedicates 1 MB of main memory for graphics
- ➔ **Enable, 8 MB** DEFAULT Dedicated 8 MB of main memory for graphics

➔ DVMT Mode Select [DVMT Mode]

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

- ➔ **Fixed Mode** A fixed portion of graphics memory is reserved as graphics memory.
- ➔ **DVMT Mode** DEFAULT Graphics memory is dynamically allocated according to the system and graphics needs.
- ➔ **Combo Mode** A fixed portion of graphics memory is reserved as graphics memory. If more memory is needed, graphics memory is dynamically allocated according to the system and graphics needs.

→ **DVMT/FIXED Memory [128 MB]**

Use the **DVMT/FIXED Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. This option can only be configured for if **DVMT Mode** or **Fixed Mode** is selected in the **DVMT Mode Select** option. If **Combo Mode** is selected, the maximum amount of graphics memory is 128 MB. Configuration options are listed below.

- 64 MB
- 128 MB **DEFAULT**
- Maximum DVMT

→ **Boot Display Device [Auto]**

Selects which graphics output to use first after the system is turned on. Auto selects the first available device.

- CRT
- LFP **DEFAULT**

→ **LFP Panel Type [by H/W]**

Use the **LFP Panel Type** to determine the LCD panel resolution. Configuration options are listed below:

- 640x480 18b
- 800x480 18b
- 800x600 18b
- 1024x768 18b
- 1280x1024 36b
- 1400x1050 36b
- 1400x900 36b
- 1600x1200 36b
- By H/W **DEFAULT**

➔ Sec. Display Device [CRT]

Use the **Sec. Display Device** option to select the second display device used by the system. Configuration options are listed below.

- Disabled
- CRT **DEFAULT**

➔ LFP Current Jumper Setting

LFP Current Jumper Setting shows current value of the hardware jumper setting for the LCD resolution. This is the value used when "by H/W" is selected in the setting above.

➔ LFP Brightness Control

LFP Brightness control specifies the brightness of the display.

- Minimum PMW Value: 0
- Maximum PMW Value: 127

5.7.2 Southbridge Configuration

The **Southbridge Configuration** menu (**BIOS Menu 23**) configures the Southbridge chipset.

```
                         BIOS SETUP UTILITY
  Main    Advanced   PCIPNP    Boot   Security  Chipset    Exit

 Southbridge Configuration                         | Options
 ______________________________________________    |
 Cashdraw control                  [Enabled]       | Enabled
 Audio Controller                  [Auto]          | Disabled
                                                   |
                                                   | ←→     Select Screen
                                                   | ↑ ↓    Select Item
                                                   | Enter  Go to SubScreen
                                                   | F1     General Help
                                                   | F10    Save and Exit
                                                   | ESC    Exit
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```

BIOS Menu 23:Southbridge Chipset Configuration

→ Cashdraw Control [Disabled]

The **Cashdraw Control** enables or disables the cashdraw control.

- **→ Disabled** DEFAULT The cashdraw control is disabled.
- **→ Enabled** The cashdraw control is enabled.

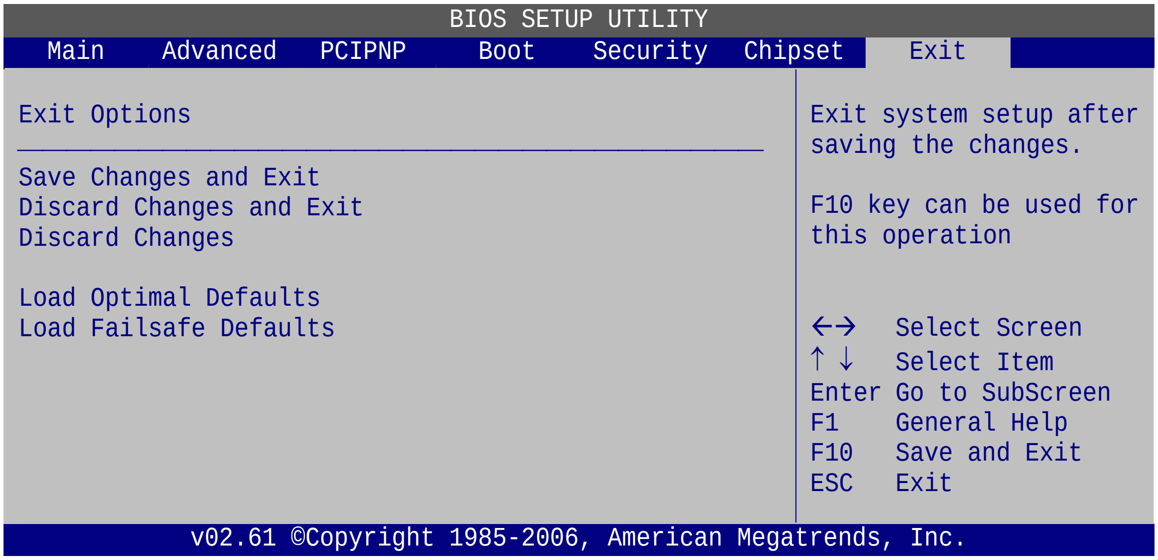
→ Audio Controller [Enabled]

The **Audio Controller** option enables or disables the audio controller.

- **→ Auto** DEFAULT The onboard AC'97 is automatically detected and enabled
- **→ All Disabled** The on-board audio controller is disabled.

5.8 Exit

Use the **Exit** menu (**BIOS Menu 24**) to load default BIOS values, optimal failsafe values and to save configuration changes.



```
                              BIOS SETUP UTILITY
   Main    Advanced   PCIPNP     Boot    Security   Chipset      Exit

 Exit Options                                        Exit system setup after
 ____________________________________________        saving the changes.
 Save Changes and Exit
 Discard Changes and Exit                            F10 key can be used for
 Discard Changes                                     this operation

 Load Optimal Defaults
 Load Failsafe Defaults                              ←→    Select Screen
                                                     ↑ ↓   Select Item
                                                     Enter Go to SubScreen
                                                     F1    General Help
                                                     F10   Save and Exit
                                                     ESC   Exit

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```

BIOS Menu 24:Exit

→ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

→ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

→ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

→ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

→ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Appendix

A

External Connector Pinouts

A.1 Introduction

Pin out signal definitions for the external connectors are provided in this appendix.

A.2 Digital Input Connector

The Digital Input connector on the top panel has the following pinouts.

PIN NO.	DESCRIPTION
1	DI0
2	GND_A
3	DI1
4	DI2

Digital Input Connector Pinouts

A.3 Digital Output Connector

The ACT-408A-N270 has one external 8-pin terminal block connector on the bottom panel for door/alarm control.

PIN NO.	DESCRIPTION
1	12V
2	GND
3	COM
4	NC/Normal Close
5	NO/Normal Open
6	NO/Alarm-
7	COM/Alarm+
8	GND_A

Output Connector Pinouts

A.4 LAN Connector

The ACT-408A-N270 has one RJ-45 LAN connector on the top panel to provide GbE connectivity.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	X1+	2	X1-
3	X2+	4	X2-
5	VCC2_5	6	GND
7	X3+	8	X3-
9	X4+	10	X4-
11	X1-	12	ACT#1
13	LINK1000 LED	14	LINK100 LED

LAN Connector Pinouts

A.5 Power Connector

The power jack on the rear panel of the ACT-408A-N270 is a 12 V DC input power connector.

PIN NO.	DESCRIPTION
1	12V
2	GND
3	GND

Power Connector Pinouts

A.6 RFID (Wiegand Reader) Input Connector

The ACT-408A-N270 has one external 8-pin terminal block connector on the bottom panel for connectivity to a RFID reader.

PIN NO.	DESCRIPTION
1	12V/5V
2	GND
3	CLK1/W0
4	DATA1/W1
5	OK
6	ERR
7	BUZ
8	GND

RFID Input Connector Pinouts

A.7 Serial Port Connector (COM1)

The ACT-408A-N270 has a RJ-45 jack for connectivity to RS-232 devices..

PIN NO.	RS-232
1	DCD
2	DSR
3	RX
4	RTS
5	TX
6	CTS
7	DTR
8	RI
SHIELD	GND

Table 5-2: RS-232/422/485 Pinouts

A.8 Serial Port Connector (COM3)

The ACT-408A-N270 has a RJ-45 jack for connectivity to RS-232/422/485 devices.

PIN NO.	RS-232	RS-422	RS-485
1	DCD	TX-	D-
2	DSR	RX-	
3	RX	TX+	D+
4	RTS	RX+	
5	TX		
6	CTS		
7	DTR		
8	RI		
SHIELD	GND		

Table 5-3: RS-232/422/485 Pinouts

A.9 USB Connectors

The ACT-408A-N270 has two USB 2.0 connectors.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBVCC2	5	USBVCC2
2	D4F-	6	D5F-
3	D4F+	7	D5F+
4	GND	8	GND

USB1 Connector Pinouts

Appendix

B

Safety Precautions

B.1 Safety Precautions

WARNING:

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the ACT-408A-N270.

Please follow the safety precautions outlined in the sections that follow:

- ***Follow the electrostatic precautions*** outlined below whenever the ACT-408A-N270 is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the ACT-408A-N270 is being installed, moved or modified.
- ***Do not apply voltage levels that exceed the specified voltage range***. Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if the ACT-408A-N270 chassis is opened when the ACT-408A-N270 is running.
- ***Do not drop or insert any objects*** into the ventilation openings of the ACT-408A-N270.
- ***If considerable amounts of dust, water, or fluids enter the ACT-408A-N270***, turn off the power supply immediately, unplug the power cord, and contact the ACT-408A-N270 vendor.
- **DO NOT**:
  - Drop the ACT-408A-N270 against a hard surface.
  - Strike or exert excessive force onto the LCD panel.
  - Touch any of the LCD panels with a sharp object
  - In a site where the ambient temperature exceeds the rated temperature

B.1.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the ACT-408A-N270 may result in permanent damage to the ACT-408A-N270 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ACT-408A-N270. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ACT-408A-N270 is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding***: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring or working with an electrical component, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component***: When handling the electrical component, hold the electrical component by its edges.

B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the ACT-408A-N270, please follow the guidelines below.

- Except for the LCD panel, never spray or squirt liquids directly onto any other components. To clean the LCD panel, gently wipe it with a piece of soft dry cloth or a slightly moistened cloth.
- The interior of the ACT-408A-N270 does not require cleaning. Keep fluids away from the ACT-408A-N270 interior.
- Be cautious of all small removable components when vacuuming the ACT-408A-N270.

- Turn the ACT-408A-N270 off before cleaning the ACT-408A-N270.
- Never drop any objects or liquids through the openings of the ACT-408A-N270.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the ACT-408A-N270.
- Avoid eating, drinking and smoking within vicinity of the ACT-408A-N270.

B.2.1 Cleaning Tools

Some components in the ACT-408A-N270 may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the ACT-408A-N270.

- ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the ACT-408A-N270.
- ***Water or rubbing alcohol*** – A cloth moistened with water or rubbing alcohol can be used to clean the ACT-408A-N270.
- ***Using solvents*** – The use of solvents is not recommended when cleaning the ACT-408A-N270 as they may damage the plastic parts.
- ***Vacuum cleaner*** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the ACT-408A-N270. Dust and dirt can restrict the airflow in the ACT-408A-N270 and cause its circuitry to corrode.
- ***Cotton swabs*** – Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- ***Foam swabs*** – Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

C

BIOS Configuration Options

C.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 5**.

Appendix

D

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H        ;setting the time-out value
        MOV     BX, 05           ;time-out value is 5 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1      ;is the application over?
        JNE       W_LOOP     ;No, restart the application

        MOV     AX, 6F02H    ;disable Watchdog Timer
        MOV     BX, 0        ;
        INT      15H
;
; EXIT ;
```

Appendix

E

Hazardous Materials Disclosure

E.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated "Environmentally Friendly Use Period" (EFUP). This is an estimate of the number of years that these substances would "not leak out or undergo abrupt change." This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。